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Water Conservation Planning Workshops - Trainer's Manual

Barry Lawson Associates, Inc.
Boston, MA

Prepared for

Missouri Basin States Association
Omaha, NE

Apr 82

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Prepared by
Barry Lawson Associates
Boston, Massachusetts
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The Missouri Basin States Association is a non-profit organization incorporated in the State of Nebraska on September 18, 1981. Its stated purpose is to ". . . conduct, encourage and participate in activities which promote interstate coordination of water resources management within the Missouri River Basin . . . ." The Association is governed by a 20-member Board of Directors composed of two members from each of the 10 states within the Missouri River Basin (Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota and Wyoming).

Barry Lawson Associates, Inc., a Boston-based consulting firm, conducts economic and planning analyses, conducts workshop and training programs and prepares information and audio visual materials. Among its nationwide programs are several designed for individual communities, states, regional commissions and federal agencies in the water resource, energy and environmental fields.

This program was supported in part with funds from the U.S. Environmental Protection Agency.

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Omaha, Nebraska

April 1982

WORKSHOP LEADERS TRAINING PROGRAM

AGENDA

8:00 a.m.	Introduction
8:30 a.m.	Workshop Materials and Techniques
10:15 a.m.	Break
10:30 a.m.	Preparing for a Workshop
12:00 noon	Lunch
1:00 p.m.	Presenting the Workshop
2:00 p.m.	Conducting the Workshop Evaluation
2:30 p.m.	Break
2:45 p.m.	Discussion
3:45 p.m.	Adjourn

BIBLIOGRAPHIC INFORMATION

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Apr 82

PERFORMER: Lawson (Barry) Associates, Inc., Boston, MA.

SPONSOR: Missouri Basin States Association, Omaha, NE.

Sponsored in part by Missouri Basin States Association, Omaha, NE.

The training program presented in this Manual represents the collaborative work of several professionals, agencies and groups during the past three years to present material and information which is useful to local communities confronted by current or potential water shortages. It has been designed to promote understanding of the shortage problem and the development of a strategy or plan for solving this problem.

KEYWORDS: *Education, *Water conservation, *Water shortage.

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Preface

As population and economic growth continue, the demand for water continues. In many parts of the country this demand is approaching the currently available supply. Moreover, quantity constraints are further intensified by problems of quality, lack of local financial capacity to update physical delivery and treatment systems, vagaries in climatic conditions, and conflict and debate over the relative priorities of competing uses for this finite resource.

The training program presented in this Manual represents the collaborative work of several professionals, agencies and groups during the past three years to present material and information which is useful to local communities confronted by current or potential water shortages. It has been designed to promote understanding of the shortage problem and the development of a strategy or plan for solving this problem. The workshop setting provides a forum within which a methodology for planning can be presented, practical experience can be gained in using this methodology, and a fruitful exchange of ideas can occur within the context of local water conservation planning.

The material and methodology included herein are based on research sponsored by the United States Geological Survey and conducted by the New England River Basins Commission, as well as a workshop program designed by Barry Lawson Associates. Workshop presentations by all of these groups plus the Missouri River

Basin Commission, now the Missouri Basin States Association, have further refined this material. This Trainer's Manual summarizes the ingredients of an effective one day training program and useful tips and background for professionals who will be presenting this material. It is assumed that these audiences will be principally local water utility managers and engineers, but may also include local officials, public interest individuals, and representatives from local industry, state, and federal governments. The most effective application of this program is with the full range of these individuals. The healthy exchange of ideas and experiences possible among these people can be focused on the common problem of the appropriate allocation and conservation of finite water resources.

Persons needing assistance with modifications to the technical elements of the program, preparation of program materials, or other assistance should contact:

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WATER CONSERVATION PLANNING WORKSHOP

TRAINER'S MANUAL

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Section I: Introduction to the Water Conservation Planning Workshop

A. How to Use the Trainer's Manual

1. The Trainer's Manual: Structured to assist the faculty in presenting a one-day water conservation planning workshop, the Trainer's Manual is designed for the people who will run the workshop. It contains information useful in presenting, evaluating, and modifying the program. The information on the yellow pages of the Manual (Sections I through VI) concerns the "process" aspects of the workshop. The right hand pages in Section VII are either materials participants receive at the workshop or those which trainers will use in making their presentations. The notes opposite these pages are comments and suggestions for the workshop trainers.

2. Workshop focus: The designers of the workshop program have assumed a high level of knowledge among workshop participants concerning the design and operation of water systems -- the supply side aspects of water use and conservation. Hence, the workshop materials do not contain substantive content on such topics such leak detection and repair, pressure reduction, meter maintenance, evaporation suppression, and watershed management. These technical topics are only discussed in terms of their value in water conservation programs. The bulk of the content in the workshop program focuses on the demand aspects of water conservation -- items such as pricing, regulation, and education. It is in these areas that the water supply personnel tend to lack

knowledge and experience. The notes provide background answers to common questions concerning demand management options.

3. Using the Manual: The sections of the Trainer's Manual contain a description of each workshop session, helpful hints on running that session, and common issues, questions, and participant concerns. Be sure to read through the entire Manual prior to running your first workshop program.

The book should be an aid as you run workshop programs. Place it on a podium, and follow it page-by-page, with your own notes and thoughts added to the pages prepared for you. Professional workshop managers follow a similar system.

B. Background to the Workshop Program

1. The original New England River Basins Commission project: From 1978 to 1980, the U.S. Geological Survey sponsored a two-year study of water conservation methods and techniques, with the work performed by the New England River Basins Commission (NERBC). The study included an analysis of existing literature, interviews with water supply managers and others who had developed water conservation programs, and case study analyses of areas and utilities that implemented water conservation programs in response to drought conditions or contamination of local water supplies. As a result of the project, NERBC developed a seven-step approach or methodology that organizes and coordinates many of the variables a water supply utility or government agency should consider when preparing water conservation plans. By organizing and presenting all of the options,

NERBC made it easier for utilities and others to develop successful conservation programs.

The original material was compiled in a NERBC publication, Before the Well Runs Dry (1980), and a supporting two-volume technical publication under the same title.

2. Development of a workshop for local officials: Once the draft methodolgy was completed, NERBC contracted with Barry Lawson Associates, Inc. of Boston, Massachusetts to evaluate the seven-step approach, refine it, and design a one-day training program to introduce the seven-step approach to local officials, utility managers and staff people, and citizens interested in water conservation. The firm helped the NERBC staff refine the seven-step methodology and subsequently designed a one-day program to present the methodology. The program combined a lecture, an opportunity to apply the methodology in a practice exercise, and group discussion to present the seven-step approach. From a program design perspective, the workshop presented the content in lecture form, allowed participants to test the approach using a hypothetical case study community, and then offered an opportunity to evaluate the usefulness of the methodology through group discussion and critique. By the end of the one-day program, the goal of familiarizing participants with the approach and its applicability and limitations was met.

The original program was tested with a group of utility and government officials. As a result of the pre-test, significant changes were made to the program.

The workshop program was presented by Lawson Associates (in cooperation with NERBC and the U.S. Geological Survey) three times during 1980 and 1981 in New England, to audiences that consisted primarily of utility managers and staff. Locations were chosen that allowed for the largest and most geographically diverse audiences. Essentially all of New England, with the exception of the lightly populated northern tier of New Hampshire, Vermont, and Maine, was covered by the three workshop locations. NERBC presented the workshop another dozen times, often in more rural areas, as a result of the success of the first three workshops, and the positive word-of-mouth publicity the workshop received.

3. Taking the workshop program and methodology "nationally": The USGS was interested in testing the applicability of the seven-step approach in areas other than New England. The Missouri River Basin Commission had a heightened interest in water conservation, in part because of the drought of the summers of 1979-80, and because of increased demands on a finite water supply. The two organizations joined forces in 1981, with the USGS providing financial support to MRBC to modify the basic workshop program and methodology to suit the particular needs of the upper Great Plains and eastern Rocky Mountain states. NERBC and Lawson Associates assisted MRBC with the preparation and presentation of its workshop program. MRBC and Lawson Associates presented the workshop program three times -- in St. Joseph, Missouri, Sioux Falls, South Dakota, and Billings, Montana. The success of this MRBC project was the starting point

for the preparation of this Trainer's Manual. A need existed in the market place for additional information and technical assistance in water conservation theory and practice. Hence, the financial support for this project. Since those workshops, MRBC has terminated operations and many of its programs have been assumed by the MBSA. To prepare material for this Manual and Training Program, MBSA contracted with Lawson Associates in 1982, utilizing funding made available through the U.S. Environmental Protection Agency.

Aside from the programs in the Midwest, NERBC took its program to other parts of New England, as well as to parts of New York and the Mid-Atlantic. Assistance was offered to New York State and the Delaware River Basin area during the drought of 1980.

Lawson Associates has presented the workshop program to several water management districts in the state of Florida in late 1981 to early 1982. In this period south Florida encountered one of the worst droughts in history, a one-in-seven hundred year situation. Lawson Associates developed a modified workshop program for the South Florida Water Management District and the St. Johns River Water Management District.

In each location across the country, the basic workshop program was well received by water utility management and employees, and others. Evaluations demonstrate that participants appreciate the method of presentation, the concise nature of the material, and the supporting written materials.

C. Purposes of the Training Program

1. Present an approach to local water conservation planning: The one-day training program presents a systematic, step-by-step approach to local water conservation planning.

2. Outline the range of programs: The training workshop presents a range of supply and/or demand management programs, options, and combinations of programs, which comprise an implementable, locally-tailored water conservation plan. Participants learn that a combination of program elements tend to have a greater impact on reducing water use. They also have an opportunity to determine which program combinations might be most applicable to their community, district, or state.

3. Explore practical considerations: The workshop program provides participants with an opportunity to explore a number of practical considerations concerning the preparation of a conservation plan and its likely success. The lecture on the seven-step approach includes insights and recommendations from people and places that have implemented water conservation programs. The practice exercise forces participants to consider the practical considerations of cost and political acceptability. Participants are encouraged to consider the implications of various water conservation options in their community or area.

4. Demonstrate the approach in a hypothetical situation: Through the use of a practice exercise based upon a hypothetical case study situation, participants have an opportunity to work with and learn how to apply the seven-step water conservation approach to their own setting.

5. Provide suggestions on options: The "game" cards used in the practice exercise detail many of the options, and combinations of options, communities can consider in their water conservation programs. Participants, therefore, work with detailed programs, analyzing their cost and political and social implications, as they develop conservation plans.

6. Assist participants in applying principles to their own localities: The program encourages participants to draw from their own knowledge and experience, and to continually test and apply conservation planning principles to their own local settings. Only by drawing from their own experience can participants be expected to integrate the theory and practice of water conservation and to apply it to their localities.

Section II: Workshop Program Materials

A. List of Workshop Materials

1. Trainer's Manual: The Manual designed for workshop faculty.

2. Before the Well Runs Dry: The NERBC - USGS publication detailing the seven-step water conservation planning approach. This is referred to as the "handbook." This publication is available for $4.50, while supplies last, from the U.S. Geological Survey, Distribution Branch, Text Products Section, 604 South Pickett Street, Alexandria, Virginia 22304.

3. Workshop workbook for participants: A spiral-bound book for workshop participants that contains an agenda, lecture notes, instructions for the practice exercise, and other materials.

4. Slides for the illustrated lecture: The slides used to support the lecture presentation(s) on the seven-step approach.

5. Exercise "game" board used in the practice exercise: The game board organizes development of a local water conservation plan.

6. Exercise "game" cards used in the practice exercise: These cards (Appendix A) contain information and options presented to participants for use in preparing a conservation plan for the hypothetical community. The cards are color coordinated with the instruction sheets in the workshop workbook for each of the seven steps.

7. Wall charts: A series of wall charts (Appendix B) prepared on sheets of paper for use in the lecture presentation on price elasticity of demand. The same material is available in the 35mm slide set. Presenters have the option of using the medium that best matches their styles of presentation.

8. Introductory exercise and workshop evaluation: An evaluation form on which participants record the value of the workshop program, and the likelihood of their using parts of the workshop program in their work (Appendix C).

9. Workshop invitation: A copy of the invitation used by the Missouri Basin States Association to invite participants to the spring 1982 workshop is in Appendix D. You can use the invitation verbatim or pick and choose individual elements to meet the needs of a particular audience or situation (such as a co-sponsorship).

10. Literature Survey and Analysis of Water Conservation: Although not included in the workshop materials, this technical manual documents the development of the original methodology by the New England River Basins Commission. It is available through the National Technical Information Service (NTIS), at 5285 Port Royal Road, Springfield, Virginia 22161; Telephone: (703)-557-4650.

B. Elements of the Training Program

Make yourself familiar with the workshop material. Confidence is an important element in the successful conduct and presentation of any workshop or training program. The audience needs to feel that you are in full command of the content and the process of a workshop. They will feel more comfortable "submitting" to the exercises of a workshop if they have faith in the workshop faculty. Attention and recall will increase when the participants think the faculty represents a credible source of information and ideas. The first step in feeling comfortable and confident in a workshop setting is to become thoroughly familiar with the workshop elements.

1. The seven-step approach: Read and underline a copy of Before the Well Runs Dry (handbook) to familiarize yourself with every aspect of the seven-step approach. The methodology is unique because of the way it coordinates each step and decision required to develop effective water conservation programs. The methodology itself is not a new innovation for water conservation planning; rather, it is a tool that was developed after studying past successes and failures in conservation planning.

2. The case study community: A hypothetical small community in a typical Missouri River Basin state was created as a case study for use in the practice exercise. Read the case study carefully. You can make some changes to the community description, but recognize that all of the numbers (costs and impacts) are based on conditions in this community. Hence, you

cannot easily change elements that will affect the numbers used on the program cards. You may change factors such as the location of wells, the groundwater/ surface mix, and the amount of agriculture in the area.

3. Plan exercise material: The best way to become familiar with the plan exercise material is to read the instructions carefully and complete the practice exercise. Keep notes on areas where you and/or your group had difficulty understanding the instructions or activities of the exercise. After "playing the game" once or twice and watching others play, you will feel comfortable with the exercise structure, operation, and intent.

4. Evaluating the program: There are two aspects of evaluating this workshop program: (a) the written workshop evaluation; and (b) self-evaluation of water conservation plans developed by participants during the practice exercise. The written evaluation is straightforward. To become familiar with the questions and value of the written evaluation, complete a copy for yourself.

Evaluating the results of the practice exercise is more difficult because it requires workshop participants to critique one another's completed water conservation plans. The process is essentially one of having one small group critique the plan of another. The workshop faculty will facilitate this discussion. Once you have led one or two practice workshops, you will feel comfortable with this evaluation process.

C. Acquiring Additional and Supplemental Materials

As you travel from site to site, or talk to utility managers and other potential participants when making arrangements for workshops, ask questions about their experiences with water conservation, water shortages, and water resource related problems. The anecdotes you collect while organizing workshops will prove helpful in building your own credibility at workshops. Telling a local story, or showing sensitivity to local problems in the introduction or lecture, will help to capture the attention and interest of the audience. Write down stories as you hear them, and organize them according to type and location. Refer to these files as you take the workshop to locations within the same geographic area.

Section III. Workshop Program and Techniques

A. Suggested Program and Schedule

A typical water conservation workshop may be scheduled as follows:

Agenda

8:30 a.m.	Registration and Coffee
9:00 a.m.	Welcome and Introduction to Program and Staff
9:15 a.m.	Natural Resource Limitations of the Area
9:35 a.m.	Practical Considerations in the Development of Water Conservation Plans
10:00 a.m.	Program -- Case Study Community and Instructions
10:10 a.m.	Case Study Exercise: Step One
10:30 a.m.	The Seven-Step Approach -- An Illustrated Lecture
11:15 a.m.	Case Study Exercise: Steps Two, Three and Four
12:00 noon	Lunch
1:00 p.m.	Case Study Exercise, Continued: Introduction -- Steps Four through Seven
2:00 p.m.	Group Discussion and Review of Conservation Plans
2:45 p.m.	Coffee Break
3:00 p.m.	Application of the Seven-Step Approach to the Home Situation
3:30 p.m.	Questions and Answers
3:45 p.m.	Evaluation and Adjourn

B. Rationale Behind the Choice of Workshop Techniques

It is helpful to know why the workshop designers chose the particular formats (or techniques) for the individual workshop sessions.

1. Introduction: Setting a positive tone is an important aspect of any training program. The more comfortable participants feel, the more receptive they will be to learn new information and interact with others. The introduction provides an opportunity for participants to get to know the workshop faculty and one another. Information provided about the day tells the participants what to expect and the time schedule for the day. "Walk" participants through the workbook and tell them a bit about each session. People tend to work better, and learn faster, if they know the rules of the situation and the time schedule. A warm-up using the introductory exercise gets people talking, establishes a basis for active group participation, encourages the flow of information among participants, and relaxes the participants. It also draws attention to the workshop evaluation which each participant should complete at the conclusion of the program. Responses to the ice breaker exercise can create a group profile. As participants begin to talk of their water conservation experiences, the workshop faculty can develop a sense of the level of knowledge and experience of the group, and collect examples to drop into the lecture to make it more pertinent to the group.

2. Resource limitations and practical considerations: Both of these short sessions are delivered by lecture punctuated

by slides or visual aids. The resource limitations session sets the stage for the workshop, informs the participants of the significance of the natural resource problems confronting them, and the degree of urgency for laying out conservation plans. Examples and illustrative material from the local area are essential.

In the practical considerations session, the main lecturer of the day presents some basic points about planning for water conservation and his/her awareness of the challenges and frustrations confronting a locality and utility manager considering a water conservation plan. Making managers feel comfortable with the planning methodology and presenting this material in a more casual manner can prepare the participants for the technical lecture and case study exercise to follow.

3. Illustrated lecture: The lecture represents the most efficient means to communicate a block of new information to the workshop participants. In a single 45- to 60-minute period, the group can be introduced to the entire seven-step approach. The lecture format chosen builds upon the concept of reinforcement -- the audience is told what they will hear in summary form, they hear the details of the approach, and finally, the information is summarized for them.

Some people learn best in a lecture situation; many others do not. Typically, adults cannot pay careful attention to details for more than 45 minutes. Some people do not like being lectured to. In studies on learning and retention of information, adults have a recall of about ten percent three days after hearing a lecture. On the other hand, if a lecture is supported with audio/visual information, the retention level increases to 65 percent three days after the learning situation. The slide program is included as part of the lecture to improve retention. In addition, the visuals support the oral presentation material and provide visual relief to the audience. The slide program developed to accompany the lecture was purposely designed to look casual and informational. Pictures and words are mixed. Stiff, harsh graphs and charts are avoided to make for a more relaxed presentation of information.

The lecture was written in a clear, declarative format. Any number of lecturers can present the lecture, and provide side anecdotes, as appropriate.

The visuals on price elasticity of demand are provided in both slide and wall chart form (Appendix B). Given the complex nature of the subject matter, each presenter will have a different style for working through the mathematics on the price elasticity examples. Some people will write the numbers on the wall charts, and work through numbers much as a math lecturer might. Others will feel more comfortable presenting the examples by pointing to the slides. The content remains the same; only the visual aid type changes.

4. Small group exercise and discussion: Listening and watching are useful instructional tools for presenting concepts and ideas. What makes the learning occur, however, is practice. If participants are given an opportunity to test new ideas and concepts in a low risk situation, their learning tends

to be more complete. Participants learn how to apply a methodology; they learn how to integrate the new ideas into their way of working and thinking.

The practice exercise meets this need. Participants are given an opportunity to work as members of a team to develop a water conservation plan for a hypothetical case study community. The problems that they might confront when preparing a conservation plan for their utility will likely arise in the hypothetical setting. Not only do they get to solve immediate problems, they benefit from the experience of others with similar interests and needs.

This technique reinforces the knowledge that they already have, and builds upon it. It helps them to transcend the theoretical, and to learn to apply the seven-step approach in a problem situation. The practice exercise illustrates and reinforces the lecture material.

5. Large group debriefing: The large group exercise meets several training needs. Workshop participants have a good time showing off their plans; the process of having one group critique another builds a healthy competition that adds to the enjoyment of the exercise. The large group discussion reinforces learning by highlighting the similarity of questions and concerns from group to group. Finally, participants learn by observing how different groups develop different solutions to the problem. There is no right or wrong answer in the small group practice exercise. By evaluating the diversity and rationale for plan development, participants see options and solutions different

from their own.

6. Local situation discussions: The last stage in learning and reinforcement is to take the audience from the case study to their home situation. Essentially, the process is one of helping participants think through how they will apply the seven-step approach to their utility/community. This is accomplished through the use of a local water conservation planning worksheet (Appendix F) and a discussion of local problems and concerns that participants face in applying the methodology to their home situations. One end product of this part of the workshop is a list of issues to discuss; another is each participant's schedule for applying water conservation planning principles to his home setting.

7. Questions and answers: Answering any remaining questions or issues participants may have is an appropriate way to end the workshop program. It is the final opportunity for participatory learning.

8. Evaluation: A written evaluation form is suggested and provided. Keeping the introductory exercise and evaluation forms together permits the staff to conduct a cross-tabular analysis of the relative reactions of types of participants.

C. Matching Techniques to Presenters and the Audience

The methods of presentation vary considerably in the workshop; this provides an opportunity to match faculty presenters with techniques based on their styles and abilities. For example, some people feel comfortable lecturing, while others may feel more at ease facilitating group discussions and critiques. Assess your own strengths and weaknesses and assign faculty according to ability and preference.

D. Establishing and Maintaining Control of Program

In most settings, the public speaker is perceived as a credible and respected source of information and ideas. The presenter inherently has assumed power because he/she is the primary speaker. The participants know that the presenter has control over information and other aspects of the workshop. The assumed credibility can be lost if the presenter appears disorganized or lacking in knowledge. Good preparation prevents this loss and permits the presenter to project an air of confidence. The audience naturally assumes that the speaker is confident and competent. Let the perception continue even if you feel nervous.

Section IV: Steps in Preparing for the Workshop

A. Selecting Participants

This workshop program has been designed for water utility managers (public and private) and staff, such local officials as mayors and aldermen, boards of utility supervisors and owners, and citizens with an interest in water conservation (e.g., members of a local League of Women Voters or a Chamber of Commerce). Since the program assumes some knowledge of water supply system design, some water utility officials must be present at all workshop programs as participants. It is useful to mix audiences so that water supply professionals and others with an interest in water conservation and water resources sit at each table. In this way there will be a healthy exchange of expertise, perspectives, and ideas among political and technical professionals in the community.

1. Publicity: Direct your publicity to these potential participants. It is important to send invitations to the audience for which the workshop was designed. If an audience other than the one defined is convened, they may be disappointed with the program and material.

2. Participants' reasons for attending: Use the invitation as an opportunity to collect information on the audience. Include several demographic and informational questions to be answered as a part of the registration form. This information will help you to determine participant levels of

knowledge and understanding, their level of interest in water conservation, and their reasons for attending. This information will prove helpful in tailoring the specific workshop program. Using this information in the introduction to the workshop (in conjunction with the introductory exercise) will build credibility with the audience. It is comforting to hear workshop participants say, "They sure know about our problems and needs. How did they find out so much about us?"

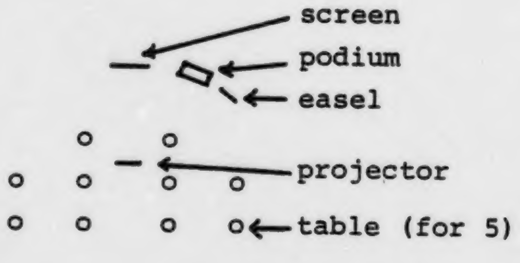
B. The Question of Sponsorship

One of the questions you will consider is whether to co-sponsor the workshop with such other organized groups as the local chapter of the American Water Works Association (AWWA), state rural water associations, or other professional organizations, or to offer the workshop program as an exclusive enterprise of the sponsor. There are advantages and disadvantages to co-sponsorship. It can provide a partner with existing credibility with the audience, an up-to-date mailing list, and some free logistical support. The original NERBC workshops in New England were successfully co-sponsored by the New England Water Works Association. On the negative side, co-sponsorship adds complexity to the workshop administration, and may bring the negative reputation of an organization. Before deciding on co-sponsorship, find out if the organization has credibility with potential attendees. Several random phone calls to selected potential attendees should answer your questions.

C. Choosing an Appropriate Site

The location of the workshop should be as convenient to the expected participants as possible. Travel convenience, cost, and opportunities to get away from the normal business routine are important. The specific workshop site should be centrally located, accessible by mass transportation and private transportation, have adequate parking facilities, and have a catering or other food service to provide lunch and beverages. Consider using a location that is familiar to water supply professionals, such as the locations where professional associations meet. A phone call to the co-sponsoring organizations will yield information on past meeting locations.

The meeting site must have a room of sufficient size for the expected number of participants, as well as tables large enough to hold the game board (one game board per table). Estimate 25 square feet per participant when choosing a room size. The game board is approximately three feet by five feet. Tables large enough to accomodate this board can be a problem, so check possible meeting sites early. Five or six people should be able sit comfortably around each table.



D. Selecting and Training Presenters for the Program

The people chosen for this workshop program must have good communication skills. They must be able to relate to a diverse audience and feel comfortable talking in public and fielding questions and comments from a group. Presenters in the workshop must receive training in the concepts and techniques built into the program. They must know the content of the Trainer's Manual, and feel comfortable with the substantive content of water conservation planning. You may want to consider offering a one-day training program to familiarize them with the Manual and program content.

The assignments for individual faculty members are critical. Not only should these assignments be made carefully, each member must be aware of the responsibilities embodied in these assignments. Moreover, the entire faculty must operate as a team, with each member playing a supporting role to other faculty members. The major assignments include (1) a person to be in charge of the registration procedures and table; (2) a moderator, or emcee, whose responsibility may be to welcome attendees, provide an introduction to the program and faculty members, and ensure that the overall schedule is followed; (3) a lecturer, who combines good presentation skills with technical knowledge; and (4) a technical support person who can assist on technical questions, visual materials, and case study exercises. Two, three, or four people may be required to fulfill these assignments, depending on the number of attendees, the availability of support people, and the experience of the faculty.

E. Practicing the Use of Techniques

The best way to feel confident about the materials and the program is to read all resource information supporting the seven-step approach and to practice running each of the workshop sessions. This includes all slides and other illustrative materials.

F. Preparing the Materials

Have all materials for the workshop collated and bound prior to the workshop. Do not wait until the morning of the workshop to organize yourself and your materials. This task includes organizing the cards for the practice exercise so that you can set up the game boards easily and quickly.

Proof all written materials several days in advance of each workshop to make sure that there are no typographical errors in the material. Maintain high quality materials. This builds credibility with the audience.

G. Steps to Take in Advance

Prepare a checklist of arrangements to make before each workshop, and follow it carefully. The checklist used by Lawson Associates (Appendix E) is one helpful tool for you to refer to prior to each workshop. Place a check mark by each of the appropriate items as you complete them. In addition, be sure to complete arrangements for the following:

1. "Market" survey: Collect information (through the invitation, or co-sponsoring organization) on the likely attendees and their needs. Make modifications to the program as necessary, to meet their needs.

2. Invitations: Mail invitations four to six weeks in advance. This length of time is necessary for busy people to free a full day on their calendars. Even with a well targeted mailing list, plan to mail four or five times more invitations than the number of people expected at the workshop. If possible, call key people in advance, and ask them if they plan to attend the workshop. Getting a verbal commitment by phone will, in all likelihood, be sufficient to get the individual to the workshop. To people who respond quickly to the mailed invitation, mail a follow-up reminder two weeks before the workshop.

3. Organizing registration: If registration is organized so that participants can sign in quickly and easily and receive workshop materials prior to entering the workshop room, their initial impressions will be that the entire program will be well organized and professional. Two hints for success: (a) arrive early and be set up well in advance, and (b) have receipt forms filled out prior to participants' arrival.

4. Food, coffee: When making arrnagements for the workshop site, remember to provide coffee, tea, or juice (for non-caffeine drinking audiences) in the morning, a light lunch, and soft drinks, and juice or coffee for the mid-afternoon. Participants will look forward to their beverage and lunch breaks. Spending seven or eight hours on one task, rather than

the dozen tasks they would normally perform during the work day, can be exhausting. The beverage breaks offer welcome relief. They must be scheduled, organized, and arranged in advance.

5. Accommodations: Staff people and some attendees may require overnight accommodations. These can be made for workshop faculty at the hotel or motel where the conference is being planned. It is administratively easier to book a block of rooms and ask attendees to make to their own reservations (asking for one of the "Water Conservation Workshop" rooms.

H. Equipment Required for the Workshop

1. Tables, chairs, and their arrangement: Tables should be large enough to accommodate the game board, three feet by five feet, with five chairs around the table facing toward the front of the room.

2. Slide projector (35mm) and screen: The screen should be at least six feet by six feet in size, though larger screens and images work better. Always have an extra bulb and a long cord (25 feet to 50 feet) for the projector.

3. Registration table: The registration table should be set up with the sign-in list, handbooks, workbooks, and name tags.

4. Podium: A podium should be available and equipped with a light (that works).

5. Flip chart easels and blackboard space: A flip chart easel and blackboard should be available. The charts on price elasticity of demand should be placed on the easel prior to

the beginning of the workshop.

6. Projector table: The projector table should be large enough to accommodate the projector and the script for the illustrated lecture. It should be set up in a spot where it will not obstruct the participants' view of the slides or of the presenter.

I. Supplies Required for the Workshop

Aside from the equipment listed in (IV-H), it is useful to carry small supplies which are helpful when running a workshop. Use the following list as a guide.

1. Registration:
   - Sign-in sheets
   - Black or blue pens for registration
   - Name tags
   - Straight pins for name tags
   - Receipts
2. Introductory session:
   - Introductory exercise (attached to the evaluation form)
3. Workshop sessions:
   - Flip chart stand
   - Flip chart pads of paper
   - Water color markers
   - Masking tape
   - Note pads
4. Final session:
   - Evaluation form (attached to the introductory exercise)
5. Workshop workbook:
   - Title page with the correct date and location
   - Descriptions of the workshop presenters
   - Table of contents
   - Bibliography, if appropriate

6. Workshop Trainer's Manual

7. General supplies:

   - Scissors
   - String
   - Stapler and extra staples
   - Heavy packing tape

J. Preparing an Exhibit Table

You might want to collect sample water conservation devices and publications and display them on an exhibit table in the back of the workshop room. The publications serve as an additional resource for participants. It is useful for participants to see examples of water saving devices, leak detection tablets, and other water conservation paraphenalia. Check with the Office of Water Programs at the Environmental Protection Agency headquarters (Washington, D.C.) for publications and products available for your use. Participants could be asked to bring some of their own information for display.

K. Transporting Materials

Organize a method for transporting materials to each workshop site. All materials (with the exception of the game boards) should be placed in corrugated cardboard boxes. They are easily transported by car, bus, train, or plane. The game boards should be carried in plastic tubes designed for carrying architects' plans. The empty cardboard boxes may be left at each workshop site as refuse. The plastic tube is reusable.

Section V: Steps in Presenting the Workshop

Each workshop program should have a comfortable flow; it should seem human, well paced, and well organized. The following are some recommendations for providing the "flow" and consistency audiences seek.

A. Early Organization

It is important to be alert, organized, and in full control before the first participants arrive. The presentation room should be set up, registration table organized and coffee or other beverage available. There is much to be gained by being prepared:

- credibilty of the organizers
- efficiency and participant convenience
- the presenters feel more comfortable and confident

B. Greeting Participants

As attendees wait in line to register, and as they enter the workshop room, have workshop presenters circulate among the participants and welcome them to the workshop. It is a small but important human gesture. Invite participants to have a cup of coffee. Ask a question about the condition of their utility, why they are present, what they want to get from the workshop. This friendliness will help to make the participants feel more comfortable. In addition, it will give them an opportunity to meet the faculty as individuals, and not as "teachers." Take this opportunity to discover participants' personal backgrounds, interests, and concerns. Your program can be made more relevant, not by changing materials or every approach, but in the use of points of reference and examples. In effect, you can "talk to each participant." It makes participants feel the program is designed for them, their attention will increase, and your confident spirit may become contagious.

C. Registration

Make sure registration is well organized so that participants can register quickly and efficiently. A well organized registration and pre-registration can save time on the day of the workshop, and minimize the number of details to be covered. The ultimate is simply a check-in with all details cared for earlier. Seldom is this possible. Think of the person registering and his/her needs and concerns:

- food, special needs
- accommodations
- money to be collected
- have an exhibit table, conversation area available

This is typically a participant's first exposure to your staff and program. Remember they are clients. Treat them as your customers. Have one staff person free to get change and do special favors. Don't leave the table unattended.

Anticipate potential problems, such as:

- money sent, you haven't received
- change
- new faces
- substitute participants
- special needs
- those who must leave early/arrive late
- everyone may come at once

D. Housekeeping Details

After the greeting, provide information to participants on the location of telephones, bathrooms, smoking/no smoking policy, water fountains, and parking ticket validation. Inform participants of the time and location of lunch and breaks. Walk through the program, and provide a sense of how the day is organized and the timing of various sessions. Participants should feel knowledgeable about and comfortable with the activities and scheduling of the day.

E. Handling Technical Questions

Anticipate technical and other questions from the audience. We have done some of that for you. If you find yourself stuck on a technical question, ask the participants for assistance. They will tend to have extensive technical knowledge, and will feel good about sharing it with you and the other participants.

Keep track of the questions that arise in your mind as you go through the workshop program, and make sure you have answers to your own questions. Listen to the questions of others going through the training, and keep note of the answers.

Have enough staff members present to answer questions during the practice exercise, and to effectively debrief the practice exercise. Three staff people work well with an audience of 50 to 60 people. Two people can handle a group of 25 to 30 people.

After running several programs, you will begin to expect the same types of questions in the same parts of the workshop program. Anticipate these questions (once you've seen the pattern), and address the issues before they become questions from the audience.

F. Making Program Adjustments

If you sense that the audience is either particularly knowledgeable or inexperienced, adjust the program slightly to meet their specific needs. You may want to expand one part of the program, and de-emphasize another. Feel comfortable making minor adjustments to the program and presentations as the day progresses.

G. Session Transitions

Make a formal transition from one program session to another; clearly introduce and conclude each workshop session, so that participants know they should change gears with you.

Section VI: Evaluating the Workshop

A. Self-Evaluation

The primary objectives of evaluating the program are to determine whether participants in the workshop found the program useful and to determine how future programs may be improved. Workshop faculty, independently and in group discussion, will find it useful to make an assessment of whether the program was an effective means of introducing the material presented and of creating a productive learning environment. Discussion among faculty following the program and after analyzing participant reaction to the program will enhance future faculty performance and improve the effectiveness and usefulness of future programs. Some questions for discussion are outlined below.

1. Program goals/topics: Was the goal of the workshop program clearly stated? Did the major topics of the workshop reflect both the interest of participants and the special expertise of faculty? Was the theme of the workshop important to the audience and did it capture the attention of the audience?

2. Workshop format/techniques: Did the workshop program promote learning and understanding of critical issues? Was the schedule/agenda followed closely? Was the program just right in length, too long, or too short? Was the agenda realistic with the given time constraints?

Did the workshop format facilitate group discussion and learning? Were participant questions relevant to the program topics? Was sufficient time allocated to answer questions?

Were some training techniques more effective than others? Was the interest of participants maintained while allowing them the opportunity for discussion? Was the pace of the program appropriate, too fast, or too slow?

3. Workshop faculty: Did workshop staff identify and meet participants' objectives, expectations, and desired results? Were the presenters and supporting staff appropriate for meeting the program's goals? Were presentations and lectures well prepared and delivered? Were presenters adequately trained for their functions? Did they serve as credible sources of information? How were presentations received by the participants? Were the people who gave presentations the appropriate ones to do so? Were presenters knowledgeable, respected, and known to the audience? Did they anticipate and handle technical questions adequately?

Were supporting staff familiar with the workshop materials? Were supporting staff appropriately selected and adequately trained? Did supporting staff make participants feel comfortable with the subject matter, new material, and the approach?

Did the facilitator/moderator keep the group focused on specific issues and agenda items? Did he/she summarize main points, identify accomplishments, and conclude discussions? Was he/she neutral and knowledgeable about the subject matter to answer questions? Did he/she facilitate an exchange of ideas? Did he/she hold speakers to the time schedule?

4. Logistics: Was the site well chosen? Did parti-

cipants feel comfortable in the setting? Was the site location based on transportation and other needs of participants? Did the time and place of the workshop encourage attendance and participation? Were the available facilities and space adequate to meet the program's goals? Were room arrangements, equipment and supply requirements properly addressed? Was registration run smoothly and quickly? Were participants provided with adequate accommodations and refreshments?

5. Participation: Were participants actively involved throughout the program? Did the workshop format facilitate group discussion and learning? Did participants ask meaningful and relevant questions? Is it likely participants will carry back information about the program to the groups they represent?

B. Participant Evaluation

1. Purpose and value: Participant evaluation of the workshop program provides information on the results, impact, and value of the overall workshop program and the materials and topics presented. Data collected from participant evaluations can be used to help plan and improve future programs.

2. Evaluation technique: Written evaluations prepared and distributed to workshop participants provide a simple and quantifiable source of data on participants and their responses to the workshop program. Questionnaires are commonly used as instruments which seek information about a respondent's personal profile or opinions. The evaluation form used in the

water conservation planning workshops is in Appendix C.

Questions can be open-ended or close-ended. Open-ended questions provide a space for the participants to write a response to a question. Close-ended questions provide a space for the respondent to choose among a selection of supplied alternatives, such as multiple choice questions or checking a number on a rating scale. Close-ended questions are easiest to work with and code for analysis. At least one open-ended question should always be included, however, to allow participants to add thoughts or comments not necessarily covered in the close-ended questions.

Two important factors to consider in determining the appropriate level of detail and length of questionnaires are 1) whether enough data has been collected for a useful and meaningful analysis and 2) whether respondents feel overburdened by the number of questions they are asked to answer.

3. Evaluation themes/topics: The evaluation should be designed to make a useful assessment of: the importance, relevance, and potential usefulness of the overall workshop program; the effectiveness of presentations and workshop materials; the effectiveness of the individual workshop sessions; and the changes that could be made to improve the usefulness of future workshops.

Evaluation questions should focus on:

a. Profile of participants -- Participants have unique problems and areas of interest as well as different levels of exposure and knowledge to workshop topics. Have these unique characteristics been appropriately considered? Did certain groups of participants find the program more useful than others?

b. Relevance and usefulness of the program materials -- Is there a similarity to what participants have been previously exposed to? Was the program useful for participants for analyzing and planning for their particular needs and future strategy development?

c. Content of information presented -- What subject areas and topics were covered or not covered? Was enough material presented, too much, or not enough? Was the material that was presented well balanced, too technical, or not detailed enough? Did the presented material meet the goals and needs of the participants?

d. Method of presentation -- Did the program support learning and understanding? Were participants allowed the opportunity to speak if they so desired? Did the workshop format facilitate group discussion and learning? Was everyone involved? Did the program hold the attention of the participants and was it interesting?

4. Analysis of data collected: A great deal of numerical data will be collected. In performing a useful descriptive analysis, the evaluator should formulate procedures

for presentating the data in a more usable and meaningful form. Data collected from questionnaires are usually examined on an item-by-item basis.

The data collected may take a variety of forms, depending upon the types of questions asked. Frequency data are tabulations of the numbers of responses to multiple choice questions; this information can quickly provide an overview of participants' response. For the evaluation of individual sessions, program material, and approach of the program, participants are asked to rank, on a scale from 1 to 5, their relative satisfaction with or the effectiveness of individual program elements. Average scores, rankings, and frequency distributions can be obtained from these participant evaluations.

An average of 4.0 or more is excellent. Anything less than 3.0 is a sign that modifications may be appropriate in material, in the presentation, in the presenter, or in all three. It may be interesting to compare the evaluation of your workshops with the results of the 1981 MRBC workshops described in the final project report.

Section VII: Workshop Workbook Materials with Guide

Having reviewed the first six sections of the *Training Manual*, you as trainer should again preview all the material to be used in the workshop. In Section VII, which follows, the text of the material participants will have in their workshop workbook is presented on the right hand side of the following pages with supplementary comments, suggestions, and observations (on opposite pages).

As you prepare for a program, and certainly after you have run a program, you will want to add your own modifications and marginal notes. Let this section of the *Manual* become your own notebook as you develop your own style, approach, and material.

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Suit yourself in the introductory remarks. Some people prefer a relevant story, or even a joke or two to get it going. Don't waste time, however, and make sure that you know ahead of time how you will begin. A smile and a clear idea of what you want to say can be most effective. An outline of relevant topics follows:

- introductions
- purposes of workshop
- program schedule
- materials
- "housekeeping" details

This is a good place for a word about the sponsors, co-sponsors, or others who have assisted in making the workshop possible.

Some people have problems dealing with a hypothetical case study. It is important that participants understand that a conscious decision was made to use a typical, yet hypothetical, area so that the attention would be on the methodology rather than the accuracy or relevance of the exercise to any real-life situation.

A. INTRODUCTION

Good morning. I am ______________ from the Missouri Basin States Association. It is our pleasure to present to you a workshop on developing a local water conservation plan. Before we begin, there are a few comments I would like to make concerning this program.

First, let me introduce to you ______________ from our staff. _________ _____ has had considerable responsibility in developing this program; together we will present the program and assist you in applying the principles in both the hypothetical case as well as in your own locale.

Incidentally, the MBSA, in case you are wondering, is an association of states which ______________.

We will use a hypothetical case study approach, simulating typical major geographical, economic and political conditions. We chose a hypothetical approach in order to:

- make the application of planning principles as clear as possible;
- not introduce extraneous information (or leave any out); and
- insure that by using the same basic case, we can more productively compare notes at the end.

We are not so much interested in the specific numbers utilized in this program, only to the degree that they establish a credible context for you, the participant. Our goal is to pro-

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Refer to the schedule in the participants' workbook.

vide a training environment within which these objectives are addressed effectively. To further these objectives, we have organized you in groups of four, five or six and from different community settings so that you will have an opportunity to share ideas throughout the day with people with expertise and experience to supplement your own.

Before we get into a description of the day's program, I would like to go quickly through some housekeeping details.

- breaks and lunch
- parking
- telephones and messages
- rest rooms
- residual registration items
- smoking/no smoking
- exhibit table

Are there any questions concerning these or other administrative details? If you have any questions of this type, please see _______________; he/she will be pleased to help.

Now, a word about the program. After this introduction, the program will begin with an update on the specific resource conditions which exist in this region and have provided the incentive for us to gather here today. This will be followed by some practical considerations in developing a local strategy toward water conservation. Then we will get right into the case study and the definition of that community's problems, develop appropriate conservation objectives, and select criteria for evaluating the conservation plan to be designed and implemented later in the program (Step One in the methodology).

Hold up the books and other materials so that participants know the specific materials you will be referring to during the day.

The resource limitation session is the only one which has not been detailed in this Manual. Obviously it must be prepared for the specific audience. It should be concise, say about 15-20 minutes with time for some questions at the conclusion. Charts and graphs can be helpful, but make sure they are legible. Like other sessions it should be rehearsed ahead of time. A possible outline is:

Water Resource Limitations in the Area

A. Demand Picture
    1. Water Demand - Population by Area
    2. Water Use in Area, 1980
        a. Agricultural
        b. Municipal and Industrial
        c. Rural Domestic
        d. Energy
        e. Other
    3. Projected Demand
B. Supply Picture
    1. Water Supply - Surface/Groundwater
    2. Restrictions and Limitations
    3. Future Supply Sources
C. Summary - Major Issues
    1. Accommodating Long-term Growth
    2. Assessing Supply Availability
    3. The Quality of Supplies

An illustrated lecture on the seven-step approach to local water conservation planning follows. The remainder of the morning will be focused on Steps 2 through 4 of that approach. Steps 5 through 7 will be undertaken during the early afternoon session, and we will conclude the case study work with a debriefing of the conservation plans developed by your groups. In this way, the "brilliance" demonstrated by each group can be appropriately displayed and various approaches discussed. The final session of the day will provide an opportunity for you to apply these principles to your own local situation - an opportunity to raise and discuss issues which are critical and difficult to surmount and a chance to take home the basis for designing and developing a water conservation plan for your community or utility.

The workbook, handbook, exercise board, and program cards provide the case study, lecture material, and case study exercises necessary for the program. Now I would like to introduce ________________ who will provide an overview of the water supply/demand situation as it currently exists in ____________________ (this region).

Resource Limitations

One reason we are gathered in this workshop is the threat of a continuation of dry weather, diminishing water supplies in the

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It may be effective to present the facts as concisely as possible through the use of wall charts, slides or maps. Don't forget to include key assumptions underlying projections, and to cite the source of information.

short and/or long run. Carried to the extreme, crisis management will become the directive. To the degree possible, we would like to reduce the risk of being unprepared for more severe drought conditions should they evolve. Anticipating the problem utilizing an ounce of prevention and planning appropriate cures are a set of keys. Being aware of (and monitoring) the current and projected limitations of the water resource in this region is another set.

With respect to these limitations, we have prepared a short presentation of current and projected water use, by type of use, and of current and projected supply, by source, under specific assumptions. From this you can see that the major problems confronting us are likely to be:

The key assumptions on which this analysis is based are the following:

<key assumptions>

These assumptions and the existing situation with respect to supply and demand must be continually monitored so that the exact nature of the problem can be estimated. Your conservation plans should be keyed to this estimation.

The practical considerations session is designed to prove that the presenter has done his/her homework, understands the problems and constraints under which the participants toil and realizes that their situations are unique. Nevertheless, you have some information which has been extracted from research from around the country, and there are some lessons which may be helpful to them.

A possible outline for your comments here follows:

Practical Considerations

A. What is water conservation and under what conditions should it be considered?
B. The determinants of the "cost" of a local water conservation program.
C. Some major challenges to address.
D. Keys to success.

The data for our analysis is provided through _____________. Other information you may wish to have access to is ____________.

Now, it is in this environment of probability, projection and risk that we proceed with this program. How shall we, as officials of towns, counties, utilities, and states plan our response? First of all, there are some very practical considerations of which you are only too well aware. Let's discuss a few of these and then get on with the task.

Practical Considerations in Designing a Conservation Plan

What is water conservation? Quite simply, it is the reduction in amount of water used by consumers.

A conservation program makes sense when there looks like there may not be enough water to go around, at least in the quantities that people customarily use. In these cases, and at current or projected prices, supply will not match demand. The available strategies are some combinations of short and long term actions to reduce demand or increase supply. It is as simple as that.

As we discussed several minutes ago, the severity of the problem will vary from place to place, and so, too, therefore,

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will the applicability of these comments and the entire workshop program. Furthermore, what you already know and have done, can mean a great deal and certainly will influence what you want to get out of this session. At least the possibility of water conservation has crossed your mind or you would not be here. Our job, then, is to provide some information, an approach, and suggestions for you to ponder. It is also our purpose to provide a forum for you to discuss these issues and your experiences so that as many people as possible benefit from your insight and experience.

Now, there are a series of questions which have to be crossing your mind as you consider water conservation in your locale. Among these may be:

- When does one know when a conservation program should undertaken?
- What will it cost in time and money to design and implement?
- How can we insure its cost effectiveness?
- What are the biggest challenges facing us?
- Are there some keys to insure success?

And you may have others. . .

With respect to the first question, the safest way of knowing is to have good data, be informed, involve others in the decision, and explain the situation clearly to the public. Be aware of the cost consequences, and remember it may be considerably easier to relax or even stop a conservation program

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than it is to get one started and maintained. Among the factors to be considered are:

- short and long term problems and solutions
- projections of supply and demand
- the effect a water shortage would have on population and the local economy
- the lead time necessary to get programs in place and to take effect (remember, if you wait too long on a water conservation plan, you may find yourself into crisis management - a considerably more serious situation)
- there are two types of error: those of omission (of not doing a plan and later wishing you had) and those of commission (preparing a plan but not needing it). Which error is the less advisable for your community?
- you are dealing with probability and risk. Estimate the amount of each involved in your basic decision to enact a program.

What is the cost of a program? Hopefully, the net cost is zero, as far as cash flow and revenues are concerned. Perhaps more importantly, the cost of the program and the consequences of any shortage, or drought, is less than the cost to the utility and the community without the program. The total cost will be, in part, a function of:

- how you raise water rates to cover costs
- whether deficits in revenues now might be made up by revenues later
- how the costs of the program are passed on to water users or the community as a whole
- what kind of budget and existing programs you have for system maintenance, public awareness and regulation
- how expensive your conservation effort must be, a function of the amount of volunteer help, institutional leadership available, the cost of outside consultants (if needed at all), and the sophistication you decide to employ (risk to be avoided).

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The "four E's" turn out to be relatively easy for people to remember. It is not always clear what role criteria are to play. If there are puzzled looks, perhaps it will be helpful to explain that when a plan is completed, it is important to test its relevance and applicability. This test can be made by applying these criteria to determine if the plan satisfies each of them. It is also critical that planners know what these are before they start planning.

How about cost effectiveness? This is difficult to estimate ahead of time, of course. The best you can do is look at what economists call the "opportunity cost" of not undertaking a program under the probability of a water shortage of varying degrees of severity. Once you have set your goals, interim and long term, then you can determine what you feel will be the cheapest or most palatable method for achieving those goals. Sorry we can be no more helpful on this one.

What are the biggest challenges facing you and your community in preparing for a water conservation plan? Take your pick. Overcoming natural inertia against conserving water, both from those who like to turn on the spigot and get water, and from the utilities who depend on the revenues from such use is certainly a major one. There are obvious political realities to be considered. Achieving a balance among all the possible criteria you may wish to consider - i.e., the 4 E's: efficiency, effectiveness, equity, and enforceability - will be critical.

The fact that few, if any, of us know what the price elasticities of demand for water are in our local communities doesn't make the task of raising water rates any rosier. Some of you may even have to be concerned with what to do if revenues rise as a result of higher rates. Dealing with the press and local media when they have never noticed you before can be a challenge for many. And starting late and then rushing to put through a program quickly, particularly when regulatory procedures need to

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These lessons are good, and you may have others. Go through them slowly as though you were giving them the Ten Commandments.

Each table should spend a little time with members getting acquainted. Group dynamics cannot be avoided. Make sure each table selects a spokesperson at this point who will insure that the team continues to make progress in getting through the case study, and who will be responsible for the presentation to the entire group at the end of the case study.

be installed, will inevitably lead to oversights, misunderstandings, and confusion - and more potential challenges.

From all the studies conducted of the water conservation efforts that have been undertaken around the country, there are some lessons from which we can all learn. If you want to be successful, more than likely you will employ some healthy combination of the following:

- community understanding of the problems and options
- community leadership to overcome inertia and take positive action
- coordination among the agencies responsible and those affected by the program
- dogged pursuit of the four E's - the criteria
- continual monitoring of the problem and progress toward goals
- a short and long term perspective, with a policy directed to both
- knowledge of what you are trying to accomplish, an ability to explain it well as sell it to the community
- a plan, or strategy, incorporating all of these

The time has come to look in more detail at the specific decisions and steps which must be undertaken to have a successful plan. At the end of the program you will know how to proceed once you determine what is appropriate for your community, and will have both information and experience to assist you in preparing your plan.

Let us get on with the case study approach. Take ten minutes to read it, become familiar with the facts and issues at

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Provide participants with references to pages in their workbooks.

hand and discuss it briefly with others at your table. After you have done this, spend 20 minutes completing Step One as a group at your table. The case study is found on page ______ in your workbook and the instructions for Step One on page_____.

The lecturer should begin by providing a brief introduction, establishing how long and in what way he/she has been involved with water conservation. Following the introduction, the lecturer may wish to share an example of a local water supply problem and explain what decisions the community faced in solving the problem. Share an example which one of the participants might have suggested or rely on an example from the introductory exercise. Collect stories/examples from participants at each workshop.

These are the lecture notes reproduced for the participants in their workbooks. Don't feel you have to read every word.

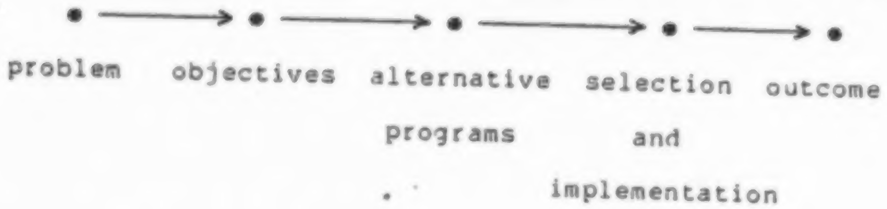
The purpose of this presentation of a planning methodology is to provide a foundation for the seven-step process. There is nothing magical about seven steps, in fact it is pretty arbitrary. But it is common sense, and herein lies its strength. Describe carefully but quickly the ordinary planning process starting with problem identification through to program or policy selection and outcome. Yes, the process may be continuous!

B. WATER CONSERVATION LECTURE

The planning approach is designed to help you to:

- consider the full range of options
- evaluate the advantages and disadvantages of various options
- assess the potential impacts of each option on your utility, the users and the community

We can look upon the seven-step approach as a typical planning model:

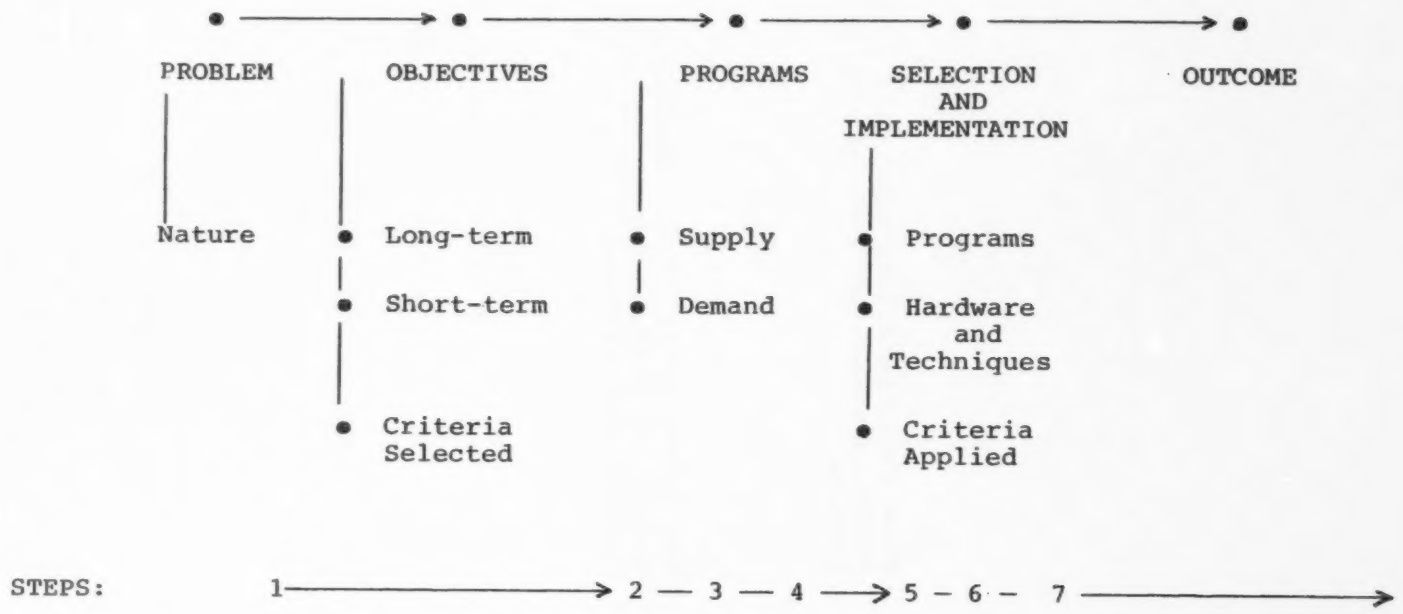

problem
objectives
alternative programs
selection and implementation
outcome

Now, modifying this basic planning model to the area of local water conservation, makes it just a bit more complicated, but essentially a special case of this model, as is shown on the chart on the following page.

NOTES

Just point out that the local water conservation planning methodology is a variation on the general theme of a planning model. The items below the five top stages are implications used in the conservation methodology. The steps on the bottom demonstrate the relationship between the steps in the seven-step methodology and the stages in a planning model.

PLANNING MODEL EXPANDED FOR APPLICATION IN WATER CONSERVATION


PROBLEM
OBJECTIVES
PROGRAMS
SELECTION AND IMPLEMENTATION
OUTCOME
Nature
Long-term
Short-term
Criteria Selected
Supply
Demand
Programs
Hardware and Techniques
Criteria Applied
STEPS:
1
2 — 3 — 4
5 – 6 – 7

NOTES

Note that the slides have been asterisked (*) so that a slide operator can key the slide presentation to the lecture.

The first slide is on the screen for a considerable amount of time. Hence you should move right along through this section.

And all of this occurs in an environment of available resources (e.g., money, people and leadership) and limiting constraints (e.g., weather and climate, economic conditions). And, as is evident, this model, as presented, is process-oriented, not necessarily time-oriented. In a few minutes, when we get to the lecture on the seven steps, you will see that the seven steps in the methodology correspond to the specific steps in the generalized planning model for water conservation.

Turn now to the slides for a preview of this seven-step methodology.

* (title slide)

*

The first step is to analyze the problem and establish a conservation goal. There are three aspects of this first step:

1. Evaluating whether the community has an average demand problem or peak demand problem;
2. Establishing the percent reduction needed; and
3. Deciding whether the problem is long-term or short-term.

The next step requires an analysis of whether your goals can best be met at the supply end--making improvements in the water supply system--or in the demand or consumption side of the system, or a combination of both.

NOTES

The third step calls for you to analyze the net cost and impacts of various management options.

On the supply side, analyze five management programs:

- Metering and meter maintenance
- Leak detection and repair
- Pressure reduction
- Watershed management
- Evaporation suppression

If you choose to work on the demand side, the third step in the approach calls for analyzing the impacts of one of three tools to reduce water consumption:

- Price - an economic incentive, encouraging users to conserve to save money
- Regulation - a legal incentive which requires users to conserve to comply with the law
- Education - a voluntary incentive which seeks to change behavior or attitude through information and explanation

You may choose to mix price, regulation, and education to develop a successful program. Experience has shown that education plays a crucial role in raising the effectiveness of the other incentives, especially in a crisis situation.

NOTES

It is important to explain the situation to consumers, describe the action being taken or proposed, and explain what consumers should do and why these actions are necessary.

In Step 4, consider ways to avoid or minimize any adverse impacts evident in the supply and demand management programs you are reviewing.

In Step 5, choose and design the specific supply and/or demand management programs you will use.

For demand management programs, this includes choosing new water rates, water use restrictions, or educational materials.

In Step 6, choose devices -- the actual hardware or techniques -- that physically reduce water use.

For supply management, the hardware/techniques include the five programs already mentioned. For demand management, they include:

- water saving fixtures
- reuse/recycle systems
- user habit changes

NOTES

You might refer to the fact that this step (1) is the same one they worked on briefly before the lecture.

Supply devices can be used alone, or in conjunction with a demand program.

In the final step, combine the results of your various analyses and decisions in the form of an implementable water conservation plan.

O.K. Let's look at the seven-step program in depth.

THE SEVEN STEP APPROACH IN DETAIL

*

STEP 1, IDENTIFY PROBLEM/ESTABLISH A CONSERVATION GOAL. This is the key to the planning procedure because all decisions are based on whether the various alternatives under consideration can meet the goal.

*

The goal is defined by three factors or needs:

- peak and/or average use has to be reduced
- high or low percentage reduction in use is needed, and
- short- or long-term time span

Peak use refers to the summer mean daily use caused by outside uses. Average use refers to the annual average use.

These definitions of low and high are arbitrary, of course. Local circumstances may influence your determination of the break point between the two.

Some would call some aspects of "supply management," "systems maintenance."

When stating percentage reductions, 1-10% is considered a low percentage reduction, and over 10% is considered high.

A short-term time span is approximately one year or less, while long-term is a year or more.

*

At this point, it is essential to raise the question about the criteria to be applied. As you pursue your goals, achieving a balance among the four criteria (efficiency, effectiveness, equity and enforceability) - a balance which is acceptable to all parties - is a major challenge and it must be dealt with squarely.

*

STEP 2, CONSIDER SUPPLY AND DEMAND MANAGEMENT APPROACHES

This step is conceptually straightforward. Yet it requires considerable analysis and planning.

The goal of supply management is to improve efficiency and reduce waste within the production and delivery system. It is often the best long-term option because conservation goals are met without depending on water users. While this is standard operating procedure for a well-run utility, sometimes a water supply problem can be solved through better management alone.

NOTES

These statements hold generally, but there will be exceptions.

Supply management is best used for long-term, low percent reduction goals. It may be useful for short-term goals if your system has not been adequately maintained over the years. It may also be useful for peak use reduction if the problem is caused by inadequate storage or pipe capacity.

The advantages of supply management are:

- the program is under your direct control
- revenues can increase
- slack is maintained in system capacity

Among the disadvantages of supply management are:

- large capital expenditures are usually required
- the options are labor intensive
- a long lead time is needed

Your analysis may require much time or little time, depending upon past studies and experience. Supply management yields long-term improvements in the system. Costs are high, though the "crisis mentality" created during a period of water shortages may help to build a potential constituency in favor of long-term changes, even if they prove costly.

NOTES

It really isn't or demand management; more likely a combination.

If supply management alone is not adequate to achieve the conservation goal established in Step 1, then you'll want to consider demand management. Demand, or consumption, management requires water users to modify their behavior and reduce consumption in a home or business setting. It has the potential to achieve any conservation goal.

*

In general, the advantages include:

- Versatility
- Low expense (potential)
- Less labor intensive
- More rapid implementation

The disadvantages include the possibilities that:

- Revenues may drop
- Results depend on users' cooperation
- Political support required
- Opposition or resistance from users

*

NOTES

It has been argued by some, that Step 3 is really an analysis of net cost and impacts rather than cost effectiveness. They are correct, of course, as effectiveness would be better dealt with in Step 5. But all the supporting materials have been printed, and it isn't all that important to raise the issue unless someone else does.

STEP 3, ANALYZE THE COST EFFECTIVENESS AND THE IMPACTS OF VARIOUS SUPPLY AND DEMAND MANAGEMENT OPTIONS

*

For supply management, there are five programs:

- Metering and meter maintenance
- Leak detection and repair
- Pressure reduction
- Watershed management, and
- Evaporation suppression

This type of supply side analysis is not unique to water conservation. Many of you do this as a matter of good management practices. What is unique, however, is a recognition of how to use improved supply management as a way to meet water conservation goals.

*

Metering

Metering itself does not reduce water consumption. It provides an accurate accounting of all the water used throughout the system. This information is needed for planning leak detection and repair programs, pricing programs, and other conservation efforts. If the utility decides to install new meters for all

NOTES

a system scan: actually a leak detection effort which can be undertaken by district within a whole system, or at a more localized basis utilizing listening devices.

a water audit: an account of the quantity of water from the point at which it enters the system (e.g., treatment facility) to the points at which it leaves the system. The concern is to isolate the metered, the unmetered but accounted-for, and unaccounted for water in a system.

its users, and in conjunction, implements an appropriate water rate, a long-term reduction in water consumption can be realized.

*

Leak Detection and Repair (LD&R)

LD&R can substantially reduce water waste within the system. LD&R also includes an analysis of unaccounted-for water.

Some categories of unaccounted-for water include abandoned services, inaccurately metered water, illegal hook-ups, and defective hydrants.

There are two basic methods for conducting surveys: if your system is losing water primarily through leaks, a system scan would be most effective; if your system is losing water through illegal hook-ups, or meter under-registration (e.g., unaccounted-for water), a water audit would be most effective.

Leak detection and repair programs are almost always cost-effective. They are best for long-term, low percent reduction goals. If the system has not been well maintained, leak detection might achieve a high percentage reduction goal if used as a conservation technique.

NOTES

Pressure reduction must be viewed with respect to various water uses and their elevation in the community. Some short-term gains are positive, too.

The workshop typically understates the advantages of watershed management. In some areas of the country, such management can pay handsome returns. Where groundwater levels have been declining, it should be seriously considered.

*

Pressure Reduction

Consider pressure reduction if there are a significant number of areas where pressure is high (80 lb/sq in. or greater).

Pressure-reducing valves installed in street mains or individual services can reduce waste simply by reducing the amount of water passing through the system. Pressure reduction is used for meeting long-term, low percentage reduction, average use goals.

*

Watershed Management

Watershed management is used primarily to protect or increase water flows to the supply and to protect ground water sources. Techniques include: (1) forestry management (thinning forests in the watershed); (2) zoning ordinances to prohibit inappropriate land uses within the recharge area; (3) purchasing surrounding watershed land to maintain it under your control; and (4) sub-division regulations which allow development to proceed in a manner which does not harm the watershed. Watershed management is most useful for meeting long-term, low percentage reduction, average use goals.

Evaporation can be very significant. While suppression is economic in a relatively few places, planning for evaporation losses is important.

Demonstrate how to use the charts in Before the Well Runs Dry (handbook).

*

Evaporation Suppression (reservoir covers)

Evaporation suppression is only useful when evaporation is responsible for significant water loss (greater than 10%). It is used in more arid places.

*

The impact analysis for each supply management program entails a review and analysis of the following impacts:

- Financial and economic
- Technical and environmental, and
- Legal and institutional.

Handbook Figure 3.2 details a set of impacts that may occur as a result of undertaking the different supply management programs.

Use the list of impacts as a guide, and concentrate only on those that are relevant to your setting.

*

For demand management programs, analyze the cost effectiveness and the impacts of various demand management options.

NOTES

It may be legally possible for revenue increases to only equal (not exceed) the additional costs to the utility.

Are there public utilities in the area in which you are presenting?

In demand (consumption) management programs, you have a choice of three tools to encourage users to reduce their use:

- Pricing
- Regulation, and
- Education

In many cases, you will combine the three tools.

All three programs can be relatively inexpensive to implement.

*

Pricing - If a pricing program is carefully designed, it can generate excess revenues while it encourages use reductions. Therefore, it should be considered as part of many conservation programs.

Pricing is best used for long-term, low percent reduction goals.

The costs of a pricing program are mostly one time costs. These costs will be for a rate survey, or cost of service study, possibly costs to institute a new billing system, and, if regulated, costs for an attorney if you have to present your new rate before a public body.

NOTES

If regulatory enabling laws and ordinances are in place, implementation is potentially rapid. Must be careful of public hearing requirements and the like.

A general information program is an essential part of a utility program. It helps to have people understand the problem if you want their assistance in solving it.

The major disadvantage to pricing is user opposition, especially from industry and local government.

*

Regulation - This program can be used to achieve any conservation goal. It is most effective for short-term, high and low percentage reduction goals and long-term, low percentage reduction, average or peak goals. Regulation can be quickly implemented and can achieve immediate results.

Costs to implement regulation are limited to costs of enforcement. If you do not have the authority and/or manpower for enforcement, you may have to secure the assistance of government officials.

The major disadvantages to using regulation are that revenues will decrease as consumption drops and some users may oppose limitations on how they can use their water.

*

Education - Education programs can help any conservation program because education is generally well received by the public and can reduce user opposition to other programs. It is effective for any goal, except long-term, high percentage reduction goals.

NOTES

The major disadvantages to education are that revenues may decrease as consumption decreases, and results are less reliable than other programs because of its voluntary nature.

*

Impacts

The types of impacts for demand management programs include:

- What a change in revenues, up or down, will mean to the utility or company;
- How a change in water rates might affect high volume users, including potential impact on employment;
- What the effect of reduced water use, such as reduced wastewater treatment costs, postponing new source development, potential damage to landscaping, and increasing the potential for adding new connections, will have on the utility or company;
- How the public will react to the conservation program, and to the perceived equity of the program;
- What it will cost to implement the program; and
- How laws, regulations, or ordinances create or limit options.

There are a lot of references to the figures in the handbook. You will tire very quickly (and so will the audience) if you give all these references. Participants have the figures in their handbook, so occasionally only remind them there is more information which they might use during the case study exercise or at home when they start applying this material to their own local problems.

One demand management program, when combined with other demand management programs, will yield a combined effect which is typically nonadditive. This is explained to the participants in Step 3 case study exercise instructions.

Figures 3.4 - 3.7 in the handbook detail most of the impacts of demand management programs.

*

You are cautioned that the implications and impacts of combining demand management programs are not additive, typically. It may be difficult, for example, to know the relative savings of water to expect from both restrictions on water use and a water rate increase.

*

STEP 4, IDENTIFY ACTIONS TO MODIFY ADVERSE IMPACTS

In Step 3 you identified the impacts of various supply and demand management approaches. In Step 4 you identify actions which can minimize the adverse impacts associated with each program, and then choose the best program.

Figures 4.1 and 4.2 in your handbooks list potential actions you could take to minimize these adverse impacts.

*

STEP 5, CHOOSE SPECIFIC SUPPLY AND/OR DEMAND MANAGEMENT PROGRAMS

Step 5 is the place to begin detailing the specific elements of a conservation program.

NOTES

Once you have analyzed the cost-effectiveness, impacts, and modifications of the impacts of supply management programs, you'll be able to select programs most effective for your community. Review each supply management program again to be sure that it has the potential to achieve the conservation goal you have established. This step is much more involved for demand management.

After you've completed the analyses in Steps 3 and 4, choose the programs that are the most cost effective and have most beneficial impacts. Step 5 is the place to begin detailing the specific elements of a conservation program. On the demand side, this includes:

*

Pricing: establishing a new water rate

Regulation: choosing water use restrictions

Education: choosing education tools/devices/campaign materials

*

Pricing - There are two aspects of a pricing policy: the price level (price per unit) and price structure (price level variations based on time, quantity and/or type of use).

NOTES

Price level is more important because only when the price level is high enough -- regardless of structure -- will users consider how they are using water and conserve.

There are six basic steps for designing a new water rate.

*

A. Determine the goal for percent reduction; for example, 5% or 10%.

*

B. Estimate the decrease in water use by consumers in response to price increases. This change is termed "price elasticity of demand."

*

C. Determine the percent change of price necessary to achieve your goal.

*

D. Calculate the new total revenue, as a result of the new price.

*

E. Compare the new total revenues to your annual costs (remember, variable costs will drop as water use drops).

It is helpful to point out that these items relate to each of the four E's, and, therefore, are that much more significant. Efficiency is suggested by "covering the true cost"; Effectiveness, by "easily understood" and "discourage waste of water"; Equity, by "equitable" and "discourage. . . subsidization"; and Enforceability, by "accepted" and "politically acceptable."

- if revenues too high, may need a lower price
- if revenues too low, may need a higher price
- a price structure can change your revenues up or down

*

F. Select a price structure - price structures are used to modify price levels so that the total water rate (level and structure) can achieve one or more of the following:

- cover the true cost of supplying water
- be equitable to all users
- be easily understood and accepted by consumers
- discourage waste of water and subsidization of consumption of one user group by another
- be politically acceptable.

Twenty common price structures are listed in Figure 5.2 in your handbook. They are grouped by their ability to meet peak or average conservation goals. Like the other charts, use it as a resource to pick a structure that meets your goal.

When using pricing there are several guidelines to keep in mind:

NOTES

Turn off the slide projector! Here is a good place to switch media and go to a flip chart or blackboard visual. You may want to preface your remarks here by saying that you realize that most people are familiar with these concepts, but you will cover them quickly just in case all are not. (A surprising number will appreciate your doing this because they are not all that clear, to be honest.) For the group that is particularly masochistic, you can develop a more complex pricing lecture from the notes in Appendix B.

If there is interest (determined before the workshop) you may wish to supplement this discussion with material from notes on price elasticity in the appendix. At least reference to this material should be made for the interested participants.

- responses to a price hike generally diminish as users become accustomed to them;
- pricing is most effective in reducing peak use among residential users and average use among large volume users;
- in the Great Plains, the price of water has been traditionally low and responsiveness to price hikes is generally low, especially among residential users;
- changing a water rate often requires a long lead time;
- only propose a water conservation price hike once -- or community opposition may develop.

PREDICTING RESPONSE TO PRICING

It will be useful at this point to elaborate on this concept. Price elasticity of demand is defined as follows:

$$\text{Elasticity Value} = \frac{\text{\% change in water use}}{\text{\% change in price}}$$

The Elasticity Value is the way that economists measure individuals' response to price changes. Every individual and every community will respond differently.

Let's consider briefly how you would use elasticity to forecast user response in Shortfall. Suppose you decided to raise the price of water in Shortfall by 10% to residential

NOTES

It would be helpful, at least informative, to check before the workshop to discover if elasticity figures are available for the local region.

users. The following formula can be used to determine the decrease in water use:

$$\% \text{ change in water use} = \text{Elasticity Value} \times \% \text{ change in price}$$
$$= -.40 \times 10\% = -4\%$$

or conversely, suppose that you decided you needed to determine the price necessary to reduce residential water use by 10%. The correct formula is:

$$\% \text{ change in price} = \frac{\% \text{ change in water use}}{\text{Elasticity Value}}$$
$$= \frac{-10\%}{-.40} = 25\%$$

A 25% increase in price is necessary to reduce consumption by 10%. A detailed discussion of these calculations is available in the handbook.

The Elasticity Value can range from zero to $-\infty$. It is negative because the price of water and water use move in opposite directions. For water, some typical Elasticity Values are:

NOTES

This is good material to have on the chart!

	Range
Total residential use	-.05 to - .45
Indoor use	-.07 to - .30
Outdoor use	-.22 to -1.57
Total Commercial/Industrial use	-.56 to -1.33

The more responsive water is to a change in price, the more negative the elasticity. For example, outdoor use is more responsive (more elastic) than indoor use. Conversely, indoor use is less responsive (less elastic) than outdoor use.

There are many factors which influence the price elasticity of demand for water. Some of the important ones are:

Amount of price increase: the larger the increase, the greater the response

Average user income: the higher the income, the less the response

Typically, utilities will have to make assumptions about local elasticities. Sensitivity analysis on assumed elasticities may also be informative, and provide the basis for having a margin of safety.

Price level: the higher the price level, the greater the response on the part of users

Average number of people per household: the larger the number, the less the response

Average rainfall and temperature: the more temperate the climate, the less the response

In the case study, the elasticity values were assumed to be as follows:

Shortfall Elasticities

Residential	-.40
Commercial & Municipal	-.70
Industrial	-1.30
All Users	-.46
Summer	-.80
Winter	-.13

NOTES

Before you go back to the slides, see if there are any questions on what you have just presented. Take a couple, and if there are more use your judgment. Don't get trapped into a discussion that is above most people (perhaps even you) only to delight or satisfy the egg-heads in the audience.

The elasticity values in your community will be within these same ranges. As a utility manager you will have to estimate your elasticity values after evaluating the factors which influence price elasticity. For example, if your community had a relatively low user income and an arid climate, you could expect that the demand would be relatively elastic.

*

Regulation - Choose a regulation program from the following methods:

*

- restricting a specific water use

*

- restricting the time/season during which a specific use is allowed

*

- requiring permits for some water users

*

- restricting the quantity of water which can be used

*

- requiring appliances and equipment which use a smaller amount of water

NOTES

In places like this where the real pearls are located, create special emphasis by slowing your speech, gaining eye-to-eye contact, or otherwise demonstrating these are important points to remember.

Various regulations have different potentials for meeting conservation goals.

Another illustration (figure 5.4) in your handbook summarizes these potentials.

Keep in mind that some regulations may be prohibited in your community. In other cases, regulations may require enforcement you are not able to provide, e.g., limiting a new specific use. Finally, some regulations, such as rationing or plumbing code changes, may not be effective because of user or political opposition.

Practical experience has yielded several recommendations:

- reserve stringent regulations, such as rationing and use bans, to high percentage reduction, short-term goals, and to periods of extreme emergency, such as extended drought;
- use less stringent regulations, such as plumbing code changes and limits on specific uses, for long-term, low percentage goals;
- most regulations that limit outdoor uses are easy to implement and can achieve water use reductions immediately;
- all regulations require some level of enforcement -- make sure enforcement staff is available.

*

NOTES

Because of the significance of an education program, the community or utility may wish to prepare a special education and public information plan. Information must accompany all plan elements. A specific detailed strategy may be very effective.

Education - Education can stand on its own, or augment price and regulation programs.

The number of educational tools are many -- it is important to match the right educational tools and techniques to your community setting.

Each available tool is bound by two factors:

- type of community
- budget resources

Another illustration in your handbook (figure 5.5) presents a partial list of educational methods used to encourage water use reduction.

Some are better suited to small communities than large; some are more expensive than others.

If you are a technical person you may wish to work with communications professionals when developing educational programs. The assistance of a local newspaper editor or public relations practitioner can help yield a better, more focused program.

Past experience has provided some education-related recommendations:

NOTES

*

- Educational programs should help users to understand why conservation is needed and should provide specific recommendations on how to conserve.
- Education is most effective during a water crisis when user awareness is high.
- Keep conservation messages short and simple.
- Provide detailed data on how to reduce consumption after getting people's attention.
- Mix the media. Use visuals to strengthen claims or message. People remember pictures better than words.
- Reach as many consumers as possible with as many techniques as possible, budget allowing.
- Users need constant reminders of the need to conserve.
- School programs are sometimes successful when children teach their parents/siblings water-saving habits.

All three of the demand side strategies - pricing, regulation, and education - require the utility to forecast the impact of the selected program on the amount of water conserved. This is particularly difficult for pricing strategy. As indicated before, the response of water consumers to a change in price is measured by the "price elasticity of demand."

*

NOTES

STEP 6, CHOOSE SPECIFIC HARDWARE AND TECHNIQUES

In this step, you select techniques that will reduce water use in your community.

*

For supply management the specific hardware/techniques will depend on your individual system and preference. For example, for metering, you will have to choose the type of meter for installation and design a meter replacement/maintenance schedule. For leak detection and repair, you will have to choose a system survey method. For example, you will have to choose between aquaphones, geophones, or electronic surveys for leak detection. For pressure reduction, you will need to select the brand and size of the pressure reducing valves. Continue this exercise for the other supply management options.

Now let's return to the analysis of demand management programs.

*

There are three categories of hardware/techniques for Demand Management Programs:

- water saving fixtures
- reuse/recycle systems
- user habit changes

NOTES

These may also take some time to install. So early planning and providing incentives may be essential. Long-term savings can be significant.

Again, you need to review each technique to determine which is most applicable to your community.

*

Water Saving Fixtures:

They reduce water use by modifying the design of a conventional plumbing system.

Water-saving fixtures, recommended:

- should be approximately equal to conventional fixtures
- should not require excessive maintenance
- should reduce water use significantly
- should gain easy acceptance by consumers

There are many types of water-saving fixtures. Of more than 50 different types, the 20 most cost-effective fixtures are detailed in a Figure 6.2 in your handbook.

*

Reuse/Recycle Systems:

They reduce water use by using the same water more than once. They are best for long-term, high percentage goals.

NOTES

Reuse: Using the same water for more than one function with little or no treatment prior to discharge.

Recycle: Using the same water repeatedly, usually with some treatment.

They are generally:

- very effective
- very expensive

Figure 6.4 in your handbook details the eight situations in which reuse/recycle systems are used most.

User Habit Changes

User habit changes are designed to reduce water use by changing the user's behavior pattern. They are best for long-term, low percentage, and short-term, high percentage goals.

There are two basic behavior pattern changes:

- use less water to perform the same function
- perform the function less often

NOTES

This is one of those "pearls". Slow down and emphasize these points.

Experience has shown that this lecture should take 45 minutes give or take five minutes. There is no need to rush, but you should move right along. 45 minutes is bordering on the maximum you want to have for a slide show.

You should note that the plan must respond to and respect the criteria set out in Step 1. The plan must be technically sound and politically and administratively acceptable.

Developing a long-term or short-term education program is the key to affecting user habit changes:

- users need information before they change their routine behavior
- users need constant reminders and reinforcement if user habit changes are to continue.

Figure 6.5 in your handbook matches some habit changes with conservation goals.

*

STEP 7, SUMMARIZE CONSERVATION PLAN

To summarize your conservation plan, draw together the results of the prior steps.

*

GOALS:
SUPPLY MANAGEMENT: HARDWARE AND TECHNIQUES
DEMAND MANAGEMENT: HARDWARE AND TECHNIQUES

*

This concludes the formal presentation of the seven-step water conservation planning approach. This is a good time to see if you have any questions about the seven-step planning approach.

NOTES

It is imperative at this point to be sure each table knows its assignment, and is busy at work. Keep participants informed of time. Let them know you will answer questions individually when they raise their hands. Direct them to the page with the Step 2 - 4 instructions.

Tell participants them they can pick up on Step 4 if they had not finished before lunch. 45 minutes should be sufficient for these three steps, plus 15 minutes to apply criteria, set priorities, develop a contingency plan and prepare for their group presentation.

Between now and lunch, work as a group on steps 1 - 4. The instructions are in your workbook. The faculty will be stopping by your tables periodically to answer questions. You may not complete Step 4 before lunch, but don't worry about finishing. You will then have time to pick up where your group has left off.

LUNCH

(After lunch) Please continue with steps 5 - 7 of your exercise. Again, the faculty will be circulating to assist you when needed.

NOTES

Allow 10 minutes at the most for this reading. They can always go back to it, during the completion of Step 1.

Participants should not dwell on the numbers. Explain that numbers are for example purposes only, though they are based on typical communities in their region.

Tell participants that now that they have read the study, they should feel free to add other assumptions to make the case more workable for them. Allow them time to clarify any questions they may have about the case, both with you (the presenter) and among their own group members.

C. CASE STUDY: SHORTFALL, MONEKOTA

Shortfall is a small city of 7,500 people, located next to an intermittent stream, Corn Creek, in cental Monekota. The population has been relatively stable for quite some time, and significant new growth is not expected. All of the people are served by a central water supply system that was built in the 1930's. Ninety percent (90%) of the services are metered; the major exception being the older central part of the city. This part of the service area is a mix of residential, commercial, and municipal users. Water pressure is fairly even throughout the city, at about 60 pounds per square inch. The water utility has maintained the system consistently over the years, and it is in generally fair condition. However, in the past few years, the budget has been very tight and some programs such as regular leak detection and repair, main relining, and valve checks and maintenance have had to be dropped.

The source of supply is a series of five wells in the northwest corner of town. These wells all draw water from the same aquifer. The combined safe yield of these wells (safe yield is defined for this case study as the amount of water which can be annually withdrawn without permanent or long-term depletion of the source) is 432 million gallons per year (mgy), or an annual average of 1.2 million gallons per day (mgd). The supply just meets the annual average demand of 1.2 mgd of the city. The

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A commonly asked question concerns storage. Assume there is sufficient storage for daily peak flows plus any fire fighting requirements.

wells are designed to be pumped at higher than average rates during peak use periods. In the summer, when peak use is highest, the utility pumps water from the wells to the storage tank on off-peak hours. The stored water is then used during peak hours. With this pumping schedule, the utility can meet the average summer daily demand of 1.7 mgd (212 mgy). The average winter daily demand of .9 mgd (220 mgy) is easily met without special pumping schedules.

The major water use categories are as follows:

Residential (1875 connections)	--	342 mgy (.95 mgd)	79%
Commercial (and some municipal, 60 connections)	--	18 mgy (.05 mgd)	4%
Industrial (1 connection)	--	20 mgy (.05 mgd)	4%
Unaccounted-for water	--	52 mgy (.15 mgd)	13%
TOTAL	--	432 mgy (1.2 mgd)	

The city serves as the agricultural supply and trade center for the area. The one industrial connection in town is a long established cheese processing plant that employs a significant portion of Shortfall's residents.

Over the past few years, agricultural users outside the city limits have significantly increased their withdrawal of water from the same aquifer that the city wells tap. This large increase in use has caused a slow decline in ground water levels,

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reducing reliable safe yields, and increasing water quality problems. A new treatment plant is now needed in Shortfall to treat the well water so that it remains usable. The city has not been able to convince large agricultural users to reduce their water use to slow the rate of groundwater level decline.

The water utility is municipally owned, but it operates as a separate entity. The city council oversees the entire operation: the council must approve the budget, major projects, and rate increases. As a separate entity, the utility must meet all its own expenses through the sale of water. Traditionally, it has not been subsidized by the city, except under very extreme conditions. However, it also cannot make large profits because it ultimately has to answer to the city council which does not believe that large profits are in the public interest. Recently, the council reluctantly approved a rate increase to meet the expenses of the construction of the new treatment plant. The rate is now a uniform unit rate of $.75 per 1000 gallons. This rate generates enough revenue to meet the annual costs of $285,000 to run the utility. (The $285,000 budget includes the new debt on the bond issues floated to pay for the treatment plant). The annual costs are broken down as follows:

FIXED COSTS -- $190,000

VARIABLE COSTS -- $ 95,000 (or $.25/1000 gallons produced)

TOTAL -- $285,000

NOTES

For the past few years, the entire region has suffered from a severe drought. This shortage of rainfall has made the utility's problems worse. Peak use during the summer has been higher than usual as people have used more water to compensate for the lack of rain. Recharge to the groundwater has been reduced and groundwater levels are declining faster than "normal" as a result. The utility expects the groundwater levels to drop even further since the recovery of groundwater from the effects of a drought is very slow. Even if rainfall is normal this year, water levels will probably not recover sufficiently, nor be high enough to meet demand.

The water superintendent presented the current supply situation to the city council. They were concerned about the economic effects of the drought and authorized the superintendent to look for a new source of water. The initial search was disappointing. No other aquifer in the area is large enough to tap for public use; the aquifer that is currently tapped cannot withstand another well or deeper wells because it is already being over used. Purchasing water from adjacent users is not likely because they too are experiencing drought conditions and declining groundwater levels. In addition, distances are great, making water connections prohibitively expensive. Developing a reservoir at Corn Creek is a possibility. However, the initial analysis showed that the yield would be small, less than .25 mgd, and it would not be dependable during a severe drought because of the intermittent nature of the river flow. The cost of develop-

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ing a reservoir would be in the millions of dollars. An additional rate hike of 100% would be necessary to pay for reservoir construction. This option is politically unacceptable to the city council because they just approved a rate hike to pay for the water treatment plant.

The water superintendent feels that something must be done immediately to cope with the drought situation and the long-term projected decrease in yields from the wells. The superintendent estimates that the reliable safe yield of the wells, given that they are overpumped and that the rainfall/recharge estimates are lower now than when the system was designed, is really only 1.0 mgd, or 15% (65 mgy) short of the average annual demand.

NOTES

Prepare participants by referring to only green cards and tell them verbally what they do.

Remind the groups to discuss and jot down the criteria (the four E's) by which they intend to judge their plan.

D. EXERCISE INSTRUCTIONS

STEP ONE: IDENTIFY PROBLEM/ESTABLISH GOAL

Read the case study describing conditions in Shortfall, Monekota.

A. Review with your group the water supply problems Shortfall is experiencing. Identify the most critical problems faced by your utility as a whole. On the card marked "PROBLEM" on the exercise sheet for STEP ONE, write down the problems, in order of priority, that your group considers most critical.

B. The conservation goal is defined by three factors. Discuss as a group whether the supply/demand problems faced by your utility are:

1. HIGH percentage (10% and above) supply-demand deficit, or LOW percentage (less than 10%) supply-demand deficit.
2. LONG-TERM (one year or more), or SHORT-TERM (less than one year).
3. AVERAGE USE or PEAK USE must be reduced.

On the exercise board for STEP ONE are three cards which list the factors described above. Place a check next to those factors your group feels best define your conservation goal.

C. As you develop the conservation goal needed to solve the problems faced by your utility, also consider whether these problems could be solved more effectively on a county-wide scale. Traditionally, water users in this part of the state have attempted to solve their water deficit problems independently. As the problems have become more widespread, solutions have become more complex. Coordinated programs among utilities may be one alternative method of solving a regional problem effectively.

D. Finally, discuss the criteria your group would select to evaluate the success of your plan, once implemented. Among the criteria which you may wish to consider are those concerned with effectiveness, efficiency, enforceability, and equity. Write down on the criteria card the criteria your group chooses to apply to your program. Place this card above the boxes marked "GOAL" on the exercise board.

As particpants start Step 2, help them by locating their cards for them at relevant places on the game board.

This step is basically a misfit, and causes more questions among participants. It is so integrated with Step 3, that folks wonder what differentiates Steps 2 and 3. To forestall such questions, you might simply say that the idea is to consider the strength of the supply management programs to solve the problems of water supply. As they are almost always not sufficient in and of themselves, one usually considers both supply and demand. It is so simple, that people want to make it more challenging.

STEP TWO: ASSESS POTENTIAL OF SUPPLY MANAGEMENT

Supply management programs are implemented to improve the efficiency of production and delivery systems. Therefore, it is recommended that these programs be considered first. If they are capable of meeting the conservation goal, then you will not have to require homeowners and businesses to reduce demand.

As a group, discuss the costs and water savings for the supply management programs described on the cards marked "SUPPLY MANAGEMENT" in STEP THREE of the exercise board. Determine if the potential to use supply management to solve the problem completely or in part is high or low. If the potential for supply management is high, then move to STEP THREE and evaluate supply management programs in detail. If the potential for supply management is low, move to STEP THREE and evaluate how the problem can be solved with demand management programs.

Review the existing conditions of your utility:

- Can the utility afford a supply management program?
- If the utility cannot afford a supply management program, can it obtain extra funds to pay for the program?
- If supply management were implemented, would there be any opposition from the users or other local interest groups?
- Will there be enough time to carry out the programs to meet the conservation goal within a reasonable time?

NOTES

Presenters must be aware of the technical elements of the numbers on the cards. Preview the cards prior to the workshop, so that you can answer the kinds of questions which arise. People must realize that annual costs can include previous costs which will not now be covered by revenues (if a specific program is utilized). Few questions, if any, typically come on how the actual water saved and costs are derived. So you can relax a bit on this point.

Suggest that the group quickly read all cards to select most likely ones for their community. A review of their combined effects may suggest going back to look at other options, or even a redefinition of the problems(s) or goals.

One other point: the more experienced participants will want to develop their own programs. Encourage them to do so.

STEP THREE: ANALYZE NET COST OF MANAGEMENT PROGRAMS

Two stacks of cards marked "SUPPLY MANAGEMENT" and "DEMAND MANAGEMENT" detail a variety of conservation programs that could be used by your utility. For each conservation program, the cards contain information on the following:

1. a description of the program;
2. the estimated annual average water savings; and
3. the estimated annual net average costs to implement the program (NOTE: cost figures include indirect costs such as impact on utility revenues, as well as direct costs of the program.) Any of the programs could be implemented either way.

Review with your group all the SUPPLY MANAGEMENT programs if supply management was determined to have high potential in STEP TWO. Review all DEMAND MANAGEMENT programs if supply management was determined to have low potential.

Remember, you can combine any program from SUPPLY MANAGEMENT with any other program from SUPPLY or DEMAND management by simply adding the water saving and net cost figures together to get the totals. However, when combining DEMAND MANAGEMENT programs together, you must consider the interactive effects of the two programs. For instance, if an education program designed to reduce outdoor use and a pricing program designed to reduce outdoor use were implemented at the same time, they would be influencing the same water use. Users would respond to both programs by doing one thing -- reducing peak use. Therefore, although more people will respond to the combined program, their individual response will not double. The water savings and costs figures of combination demand management programs have been estimated and are described on the cards in the DEMAND MANAGEMENT stack.

NOTE: You can choose only one option within a management program category; i.e. one Leak Detection and Repair Program, one Education Program, one Pricing program.

If there are any other programs you feel are more appropriate than those described, use the blank cards at the bottom of the stacks to design your own program, including water savings and costs.

Place the cards which describe the programs your group decided are most appropriate for Shortfall and place them in the boxes on the exercise board under STEP THREE.

STEP FOUR: ANALYZE IMPACTS AND MODIFICATIONS TO ADVERSE IMPACTS OF MANAGEMENT PROGRAMS

After selecting a preliminary set of management programs that are cost-effective, analyze the social, political, and legal-institutional impacts of these programs.

From the two stacks of cards marked "SUPPLY MANAGEMENT" and "DEMAND MANAGEMENT", choose those cards that match the programs you selected in Step Three and place them on the exercise sheets.

Review the impacts and modifications for the adverse impacts that are listed on each card. Discuss the impacts and modifications with the group and determine whether the preliminary set of programs is still acceptable. If so, make any appropriate modifications to the preliminary set of programs suggested by the modifications - of any other modifications you may feel are important. Put a check by those modifications you are willing to make, or that apply.

If the preliminary programs are unacceptable, return to STEP THREE and re-analyze the options.

NOTE: If there are any impacts that you feel must be considered that are not listed on the cards, write them in the blank spaces on each card. Or - if you designed your own programs, use the blank impact cards at the bottom of the stacks to describe their impacts and necessary modifications.

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In Step 5, the participants simply take the cards from Step 3 that they still wish to include in their program and transfer them to the appropriate spaces in Step 5. The simplest maneuvers always cause the most problems.

STEP FIVE: CHOOSE COST EFFECTIVE MANAGEMENT PROGRAMS

In STEP THREE, you evaluated the net cost of various management programs. In STEP FOUR, you evaluated the impacts of the programs. Based upon this analysis, choose the programs that most effectively meet your conservation goal and which have the fewest adverse impacts and most desirable cost to impact ratio. Take the cards that describe these programs from STEP THREE and place them in the boxes in STEP FIVE.

Review the programs to make sure the conservation goal is met. If not, return to STEP THREE.

The MANAGEMENT PROGRAMS are one part of your draft water conservation plan.

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STEP SIX: CHOOSE SPECIFIC HARDWARE/TECHNIQUES

For SUPPLY MANAGEMENT you would have to select the specific type of retrofitting and other equipment you need or determine exactly who would be carrying out the work. This will not be done for this exercise.

For DEMAND MANAGEMENT, there are three groups of hardware/techniques that reduce water use in homes and businesses.

1. Water-saving fixtures;
2. Reuse/recycle systems; and
3. User habit changes.

Even though the purchase and installation of hardware, or the implementation of user habit changes is up to the homeowner or businessperson, you may want to assist them in their efforts to reduce water use. Many utilities have found that permanent use reductions are more likely to occur if the water supplier takes an active role in this phase of the program. Frequently, users do not purchase the best equipment, or do not take the actions that will best achieve a conservation goal. Therefore, use reductions might diminish over time unless you provide guidance on the implementation of hardware/techniques.

Review with the group the cards marked "HARDWARE/TECHNIQUES" and discuss if the utility should take an active role in this phase of the program. The cards for STEP SIX describe six levels of activity. Choose the level that best meets your program needs. Place the card that matches your choice on the exercise sheet for STEP SIX.

If none of the activities meet your needs, develop your own, including the cost per user.

The HARDWARE/TECHNIQUES are the second part of your draft conservation plan.

Remind participants to check their criteria (the "four E's"), their contingency plans, the elements of the plan that are key. Give them fifteen, five, and one minute warnings prior to the beginning of the debriefing exercise.

Remind them also to review the degree to which the initially selected goals are likely to be achieved with this plan.

STEP SEVEN: SUMMARIZE CONSERVATION PLAN

As a group, review the draft conservation plan you designed in STEPS FIVE and SIX. Make sure that: 1) the plan can effectively meet the conservation goal, 2) the adverse impacts associated with each program will not make the program unacceptable, and 3) all the elements of the plan (PROGRAMS, HARDWARE/TECHNIQUES) are well coordinated.

If all of the above conditions are met, and the program meets your criteria established in STEP ONE, then your draft plan will be your final plan.

If any of these conditions are not met, return to STEPS THREE and SIX and reconsider the MANAGEMENT PROGRAMS and HARDWARE/TECHNIQUES.

As a final exercise consider the major elements of your plan strategy. What are the specific program element(s) on which the success of your effort largely rests? Suppose that the community, utility commission or others refuse to approve these or other elements. What special efforts would you then undertake, or what contingency plan do you envision as a compromise?

Finally, choose a spokesperson who can present your plan to the entire group.

Two or three tables presenting should be sufficient. Have other tables critique or briefly describe the degree to which they differ in identification of problem or basic approach.

Keep presentations to five to eight minutes, and allow for clarification by other members of each presenting group. People like to hear themselves talk, so give all of them a chance to speak. They also lose track of time; five minutes is not much time. Keep them on schedule.

E. CASE STUDY DEBRIEFING

The purpose of the debriefing session at the conclusion of the case study is to review the conservation planning program selected by each group (table) of participants. It is important from a learning standpoint that each person at each table spend some time reflecting on the group decisions reached and the justification behind them. Moreover, in order to proceed to implementation of any plan to a local community, utility managers must "sell" their program. Debriefing provides an opportunity for two or more groups to orally present their program to the entire group and to field questions that their colleagues and the training staff may raise.

It is suggested that the staff select two groups to present their programs in five to eight minutes each, and to select two other groups to critique the same programs using their own programs as a basis for their remarks. A period of 25-30 minutes should be allotted for this session.

There are several questions which should be raised during debriefing, among them:

- If your conservation plan runs into local opposition, what would be your contingency plan, or strategy of getting community acceptance?

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- What program do you consider to be the key to successful conservation in your case study community?
- What criteria have you chosen to satisfy, i.e., how did you balance the need for effective program with the desire to be equitable? What guarantee is there that your regulatory programs (if chosen) are enforceable?
- What role (if any) did your group see for intercommunity (county or regional) programs?

Finally, in overseeing each group's deliberations during the case study, the staff may formulate other questions to address to the whole group. Often, an interesting discussion or debate is developed during the deliberations which the staff may find instructive to explore with the entire group of participants.

NOTES

The local water conservation planning worksheet is in Appendix F.

F. APPLYING THE CONSERVATION PLANNING METHODOLOGY TO YOUR LOCAL COMMUNITY

Now that we have applied the principles of conservation planning to the hypothetical community, we will turn our attention to your own local situation - your community, county or utility. We seek in this final session of the workshop to assist you in applying these principles to your own personal situations. We will do this in two ways.

First, if you are currently facing a situation where conservation may make sense, we invite you to consider completing the local water conservation planning worksheet found in the workbook. If you are not currently in a water shortage period, either look back to a recent time when you were, or alternatively, look ahead and imagine a likely situation that could conceivably evolve in your locality. Your imagination will provide you with the real life equivalent of the hypothetical case study we have spent most of the day analyzing. Work in local groups, or as individuals where only one person is representing a local area. Focusing on the issues raised on this sheet should help to break the inevitable inertia in conservation planning and provide a take-home sheet which can serve as one basis for beginning the job facing you when you return from this workshop.

The information required to complete this form is comparable to that covered during the case study. However, on the bottom of this sheet, on the time line provided, we suggest you write in the programs, distinguishing between those which are supply-oriented and those which are demand oriented, and placing brackets around the name of the program to correspond with the beginning and end of the program. In the middle of the time line, provide your own relevant time reference points. These may be in terms of months, or weeks, or they may be in terms of specific weather conditions. Remember, your definition of the problem in terms of short or long term will affect the specific time frame you use.

By completing this portion of the sheet, several issues are suggested:

- the priorities within the water conservation program
- the preparatory work required for each program
- cash flow considerations (for the utility)
- when you should begin to (or must) expect results from your programs

The second way to refocus your attention on your local utility or community is to realize that there may be some very specific questions, concerns, issues or constraints facing you in your local situations which may not have been addressed during the case study or sufficiently addressed during the program. Therefore, I would like to ask you to identify some of these specific concerns and problems. We will make a list of these as you go, but more importantly, there may those among us who can provide some insight or assistance. Among these problems may be severe limitations on your revenue raising capabilities, conflicts over appropriate land uses in aquifer recharge areas, innovative ordinances you have enacted, and the like.

We go no further, the rest is up to you. Remember, problem identification and clarification is critical. Being prepared means anticipating problems, developing a strategy to meet them as best you can, staying on top of changing situations, and demonstrating leadership and positive action, as appropriate. Engage community assistance, keep the folks informed, look for advice from all sources, but act as the responsible party you are. Credibility is a key to success, not only in getting through the short-term crisis, but in preparing the community for the inevitable next crisis and for resolving long-term problems.

Designing a long-term policy is a good idea, integrating water conservation and drought management into your water resource and community planning efforts.

Good luck, call for comforting reassurance and assistance if you like, and thank you for your kind attention throughout the program.

End of program.

APPENDIX A

STEP 1: PROBLEMS/GOALS

PROBLEM

GOAL - Average or Peak

Average use must be reduced________________.

Peak use must be reduced__________________.

GOAL - Long or Short Term

Long Term____________________________.

Short Term___________________________.

STEP 1: PROBLEMS/GOALS

GOAL - Percent Reduction

High percent reduction - _______________%

Low percent reduction - _______________%

CRITERIA

Efficiency _____

Effectiveness _____

Equity _____

Enforceability _____

STEP 3: NET COST
SUPPLY MANAGEMENT

SUPPLY MANAGEMENT

PROGRAM: LEAK DETECTION AND REPAIR #1
Water audit; perform major repairs

WATER SAVED (per year): 3% or 13 mgy

NET REVENUE (per year): -$22,000

SUPPLY MANAGEMENT

PROGRAM: LEAK DETECTION AND REPAIR #2
System audit; perform major and minor repairs

WATER SAVED (per year): 7% or 30 mgy

NET REVENUE (per year): -$52,000

SUPPLY MANAGEMENT

PROGRAM: METERING #1
Install new meters in unmetered services; replace old meters with more accurate meters

WATER SAVED (per year): - 0 -

NET REVENUE (per year): -$15,000

SUPPLY MANAGEMENT

PROGRAM:

WATER SAVED (per year):

NET REVENUE (per year):

STEP 3: NET COST
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #1
Raise uniform unit rate to
$.99 per 1000 gallons

WATER SAVED (per year): 13% or 57 mgy

NET REVENUE (per year): + $48,000

DEMAND MANAGEMENT

PROGRAM: PRICING #2
Excess use rate for res and com
users:
$.75/1000 gal. for first 33,000
gal.; $1.10/1000 gal. for all
use above. For ind. users:
$.75/1000 gal. for first
4,000,000 gal.; $1.10 for all
use above.

WATER SAVED: 10% or 43 mgy

NET REVENUES: +$1,000

DEMAND MANAGEMENT

PROGRAM: PRICING #3
Increase summer rate to $1.03 per
1000 gallons; increase winter
rate to $.80 per 1000 gallons

WATER SAVED (per year): 13% or 57 mgy

NET REVENUE (per year): +$23,000

STEP 3: NET COST
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: REGULATION #1
Alternate day/time of day outdoor use restrictions; pool filling by permit only; plumbing code changes; restaurants serve water by request only

WATER SAVED (per year): 7% or 30 mgy

NET REVENUE (per year): -$15,000

DEMAND MANAGEMENT

PROGRAM: REGULATION #2
Total outdoor use ban (including municipal use); reduce municipal use (no street sweeping, sewer or main flushing); recycle for large A-C units required; no fountain displays; car wash water recycling required

WATER SAVED (per year): 20% or 90 mgy

NET REVENUE (per year): -$60,000

DEMAND MANAGEMENT

PROGRAM: EDUCATION #1
Bill inserts; pamphlets; posters around town; billboards; school programs; newspaper articles; radio ads.; reminder items; speaker's bureau; customer assistance

WATER SAVED (per year): 5% or 23 mgy

NET REVENUE (per year): -$12,000

STEP 3: NET COST
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #1
Uniform unit rate of $.99/1000 gals.

Alternate day/time of day outdoor use restrictions; pool filling by permit only; plumbing code changes; restaurants serve water by request only

WATER SAVED (per year): 15% or 64 mgy

NET REVENUE (per year): +$43,000

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #1
Excess use rate

Partial outdoor use ban

WATER SAVED (per year): 11% or 47 mgy

NET REVENUE (per year): -$12,000

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #2
Uniform unit rate of $.99/1000 gals.

Total outdoor use ban (including municipal use); reduce municipal use (no street sweeping, sewer or main flushing); recycle for large A-C units required; car wash water recycling required

WATER SAVED (per year): 23% or 100 mgy

NET REVENUE (per year): +$17,000

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #2
Excess use rate

Total outdoor use ban

WATER SAVED (per year): 22% or 95 mgy

NET REVENUE (per year): -$43,000

STEP 3: NET COST
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #3/ REGULATION #1
Summer rate

Partial outdoor use ban

WATER SAVED (per year): 15% or 64 mgy

NET REVENUES (per year): +$20,000

DEMAND MANAGEMENT

PROGRAM: EDUCATION (IN COMBINATION WITH ANY OTHER DEMAND MANAGEMENT PROGRAM) Bill inserts; pamphlets; posters around town; billboards; school programs; newspaper articles; radio ads.; reminder items; speaker's bureau; customer assistance

WATER SAVED (per year): 2% or 8 mgy

NET REVENUES (per year): -$6,000

DEMAND MANAGEMENT

PROGRAM: PRICING #3/REGULATION #2
Summer $1.03/1000 gals

Winter $.80/1000 gals

Total outdoor use ban (including municipal use); reduce municipal use flushing ; recycle of large A-C units required; carwash water recycling required

WATER SAVED (per year): 23% or 98 mgy

NET REVENUES (per year): -$18,000

DEMAND MANAGEMENT

PROGRAM:

WATER SAVED (per year):

NET REVENUE (per year):

STEP 3: NET COST
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM:

WATER SAVED (per year):

NET REVENUE (per year):

DEMAND MANAGEMENT

PROGRAM:

WATER SAVED (per year):

NET REVENUE (per year):

STEP 4: IMPACTS/MODIFICATIONS
SUPPLY MGMT

SUPPLY MANAGEMENT

PROGRAM: METERING #1
Install new meters in unmetered services; replace old meters with more accurate meters

IMPACTS	MODIFICATIONS
1. Will improve system efficiency significantly	1. N/A
2. May recover lost revenues	2. N/A
3. May cause temporary revenue deficit	3. Borrow from other budgets

SUPPLY MANAGEMENT

PROGRAM: LEAK DETECTION AND REPAIR #1
Scan to detect major leaks; perform major repairs

IMPACTS	MODIFICATIONS
1. System efficiency improves	1. N/A
2. Costs exceed available funds; not allowed to operate in deficit	2. Raise water rate; borrow from other budgets

SUPPLY MANAGEMENT

PROGRAM: LEAK DETECTION AND REPAIR #2
System audit; major and minor repairs performed

IMPACTS	MODIFICATIONS
1. System efficiency improves	1. N/A
2. Cost exceed available funds significantly	2. Raise rate
3. Opposition from commercial users; construction will disrupt business	3. Work out acceptable plan; build support from others

SUPPLY MANAGEMENT

PROGRAM:

STEP 4: IMPACTS/MODIFICATIONS
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #1 - Uniform unit rate of $.99 per 1000 gallons

IMPACTS	MODIFICATIONS
1. Extreme opposition from City Council approval may not be granted	1. Special program for City Council to explain need for program
2. Revenue surplus may be diverted	2. Reinvest in system or other conservation program

DEMAND MANAGEMENT

PROGRAM: PRICING #3 - Increase summer rate to $1.03 per 1000 gallons and winter rate to $.80 per 1000 gallons.

IMPACTS	MODIFICATIONS
1. Residents do not like, but can live with it	1. Education program
2. Industry threatens to leave town, feels program inequitable	2. Offer technical assistance to industry
3. Revenue surplus may be diverted	3. Reinvest in system or other conservation program

DEMAND MANAGEMENT

PROGRAM: PRICING #2 Excess use rate

IMPACTS	MODIFICATIONS
1. Industry feels program is equitable	1. N/A
2. Residents feel program is unfair; organizing fight against program	2. Education program may help; but unlikely
3. City Council quietly supports	3. Attempt to make Council and industry support more vocal
4. Revenue deficit not significant	4. N/A

DEMAND MANAGEMENT

PROGRAM: REGULATION #1 - Alternate day/time of day outdoor use restrictions; pool filling by permit only; plumbing code changes; restaurants serve water on request

IMPACTS	MODIFICATIONS
1. Revenues decrease	1. Raise water rate; borrow from other budget
2. Community aesthetics	2. Inform users on how to irrigate most efficiently

STEP 4: IMPACTS/MODIFICATIONS
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: REGULATION #2 - Total outdoor use ban; reduce municipal use (no street sweeping, sewer or main flushing); recycle for large a-c units required; no fountain displays; car wash water recycle required

IMPACTS	MODIFICATIONS
1. Damage to landscape will result	1. Education may ease some opposition; exempt public areas
2. Revenue decrease	2. Raise water rate; borrow from other budget

DEMAND MANAGEMENT

PROGRAM: REGULATION #2 - continued

IMPACTS	MODIFICATIONS
3. Lack of cooperation with local enforcement agency may reduce effectiveness of program	3. Offer compensation to enforcement agency

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #1

Uniform unit rate of $.99/1000 gals.

Alternate day/time of day outdoor use restrictions; pool filling by permit only; plumbing code changes; restaurants serve water on request only

IMPACTS	MODIFICATIONS
1. User opposition-pay more must use less	1. Education program ease some opposition

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #1 continued

IMPACTS	MODIFICATIONS
2. Possible damage to landscape	2. Education program to explain how to irrigate efficiently
3. City Council may not approve rate	3. Special program for City Council to explain need for program

STEP 4: IMPACTS/MODIFICATIONS
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #2

Uniform unit rate of $.99/1000 gals

Total outdoor use ban; reduce municipal use (no street sweeping, sewer or main flushing); recycle for large a-c units required; car wash water recycle required

IMPACTS	MODIFICATIONS
1. City Council opposes; threaten to take over utility	1. Generate support from other sectors

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #1

Excess use rate

Partial use bans

IMPACTS	MODIFICATIONS
1. Industry feels program is fair	1. N/A
2. Residents feel program is unfair; will organize fight against it	2. Education program may help; but unlikely

DEMAND MANAGEMENT

PROGRAM: PRICING #1/REGULATION #2 continued

IMPACTS	MODIFICATIONS
2. Residential users oppose watering ban	2. Education program may ease some opposition
3. Community aesthetics suffer	3. Exempt public parks areas
4. Lack of cooperation from enforcement authority may reduce program results	4. Offer compensation to enforcement authority

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #1 continued

IMPACTS	MODIFICATIONS
3. City Council may not approve	3. Publicize industrial support; exempt public areas from use ban
4. Revenue deficit not significant	4. N/A

STEP 4: IMPACTS/MODIFICATIONS
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #2

Excessive rate

Total outdoor use ban; reduce municipal use (no street sweeping, sewer or main flushing);recycle for large A-C units required; car wash water recycle required

IMPACTS	MODIFICATIONS
1. Damage to landscape	1. Exempt public parks areas

DEMAND MANAGEMENT

PROGRAM: PRICING #3/REGULATION #1

Summer rate

Partial use ban

IMPACTS	MODIFICATIONS
1. Residents don't like it; but not bitterly opposed	1. Assist residents through education program to educate them how to irrigate efficiently
2. Industry threatens to leave town	2. Offer technical assistance

DEMAND MANAGEMENT

PROGRAM: PRICING #2/REGULATION #2 continued

IMPACTS	MODIFICATIONS
2. Opposition from residential sector, will boycott by refusing to pay bills	2. Education program may ease some opposition temporarily, but unlikely
3. Opposition from city council to use ban	3. Exempt public parks
4. Industry supports	4. Publicize industrial support
5. Revenue deficit	5. Raise rate on first block

DEMAND MANAGEMENT

PROGRAM PRICING #3/REGULATION #1 continued

IMPACTS	MODIFICATIONS
3. City Council does not like the use ban	3. Exempt public parks
4. Revenue surplus may be diverted	4. Reinvest in system or other conservation program

STEP 4: IMPACTS/MODIFICATIONS
DEMAND MGMT

DEMAND MANAGEMENT

PROGRAM: PRICING #3/REGULATION #2

Summer rate

Complete outdoor use ban

IMPACTS	MODIFICATIONS
1. Residents, industry, and City Council bitterly oppose this program	1. Attempt to highlight benefits versus consequences to change public opinion
2. Revenue deficit	2. Raise rate for winter

DEMAND MANAGEMENT

PROGRAM: EDUCATION #1 (ALONE OR IN COMBINATION) Bill inserts; pamphlets; posters around town; billboards; school programs; newspaper articles; radio ads; reminder items; flyers; speaker's bureau; customer assistance

IMPACTS	MODIFICATIONS
1. Well received by community	1. N/A
2. Revenue decrease	2. Raise water rate

DEMAND MANAGEMENT

PROGRAM:

DEMAND MANAGEMENT

PROGRAM:

STEP 6: HARDWARE/TECHNIQUES

HARDWARE/TECHNIQUE

PROGRAM: Utility takes NO ROLE

COST: 0

HARDWARE/TECHNIQUE

PROGRAM: Utility takes SLIGHTLY ACTIVE role - provides tips on water conservation

COST: Cost of EDUCATION PROGRAM - see Step 3

HARDWARE/TECHNIQUE

PROGRAM: Utility offers industry only technical assistance

COST: $2,500 per year for first two years;
$1,000 per year thereafter

STEP 6: HARDWARE/TECHNIQUES

HARDWARE/TECHNIQUE

PROGRAM: Utility takes MODERATELY ACTIVE role - provides water-saving fixtures at cost; provides industry with technical assistance

COST: Approximately $5,000 per year

HARDWARE/TECHNIQUE

PROGRAM: Utility takes ACTIVE role - purchases and distributes water-saving fixtures for retro-fit; provides industry with technical assistance

COST: Approximately $35,000 per year for first two years; $5,000 per year thereafter

HARDWARE/TECHNIQUE

PROGRAM: Utility takes AGGRESSIVE role - purchases, distributes, and installs water-saving fixtures for retro-fit; provides industry with technical assistance

COST: Approximately $60,000 per year for first two years; $15,000 per year thereafter

APPENDIX B

NOTES ON PRICE ELASTICITY

The Elasticity Value has an important relationship to the change in a water utility's total revenue caused by a price change. For relatively small changes in price the following relationships hold:

- if the Elasticity Value is larger than -1, a price increase will increase total revenue
- if the Elasticity Value is smaller than -1, a price increase will decrease total revenue.

Because of this relationship the following terms are used:

- if the Elasticity Value is greater than -1, water use is said to be inelastic.
- if the Elasticity Value is less than -1, water use is said to be elastic.

Most, but not all, water use elasticity values are in the inelastic range (-1 to 0).

Let's illustrate the use of the Elasticity Value for determining the conservation, revenue and cost impacts of pricing strategy.

Pricing Example

Consider the following information about a water utility:

1. Budget:

Revenue		Cost	
Revenue	500,000	Fixed Cost	400,000
		Variable Cost	100,000
Total Revenue	500,000	Total Cost	500,000
Net Revenue	0		

2. Rate Level and Structure:

Uniform unit rate of $1.00/1000 gallons

3. Water Deliveries:

500 mgy.

4. Average variable cost:

$.20 per 1000 gallons

5. Conservation Goal:

5% reduction in water deliveries.

6. Elasticity Value:

-.2

7. Calculation of required price:

$$\% \text{ change in price} = \frac{\% \text{ change in water use}}{\text{Elasticity Value}} = \frac{-5\%}{-.2} = 25\%$$

New price = old price + 25% of old price

= $1.00 + $.25 = $1.25

8. Calculation of new water use

New water use = old water use - 5% old water use

= 500 mgy - 25 mgy = 475 mgy

9. Calculation of new revenue:

New revenue = new water use x new price

= 475 MGY x $1.25/1000 gal = $593,750

10. Calculation of new cost:

New fixed cost = old fixed cost

= $400,000

New variable cost = Average variable cost x new water use

= $.20/1000 gallons x 475 mgy

= $95,000

New total cost = New fixed cost & variable cost

= $400,000 + $95,000 = $495,000

11. Calculation of new net revenue:

New net revenue = new total revenue - new total cost

= $593,750 - $495,000

= $98,750

Note the following impacts:

1. Total cost decreased because of the reduction of variable cost

2. Total revenue increased because the Elasticity Value is inelastic.

EXAMPLE UTILITY

	Pre Policy	Pricing	Regulation or Education	Pricing and Regulation Combined
Water Consumption (mgy)	500	475	475	475
Cost of Policy ($)	0	0	0	0
Fixed Cost ($)	400,000	400,000	400,000	400,000
Variable Cost ($)	100,000	95,000	95,000	95,000
Total Cost ($)	500,000	495,000	495,000	495,000
Total Revenue ($)	500,000	593,750	475,000	498,750
Net Revenue ($)	0	98,750	-20,000	3,750

Regulation Example

1. New Total Revenue = old price x new quantity
   = $1.00/1000 gal x 475 mgy
   = $475,000

2. New total cost = $495,000 (Same as pricing case)

3. New net revenue = new total revenue - new total cost
   = $475,000 - $495,000
   = - $20,000

Note the following changes from the impacts of the pricing example:

1. The utility is now making a net loss.
2. The costs of delivery are the same.

PRICING FLIP CHARTS

Chart 1:

PRICING

$$\text{Elasticity Value} = \frac{\text{\% change in water use}}{\text{\% change in price}}$$

typically, negative

Ranges:	from	to
residential	-.05	-.45
indoor	-.07	-.30
outdoor	-.22	-1.57
commercial/industrial	-.56	-1.33

Chart 2:

FACTORS AFFECTING E.V.

- Greater Response:
  - the larger the price increase
  - the higher the price level
- Less Response:
  - the higher the average income
  - the more people per household
  - the more temperate the climate

Chart 3:

An Example:

(assume E.V. = -.40)

$$\begin{aligned}\text{change in water use} &= \text{E.V.} \times \text{change in price}\\ &= -.40 \times +10\%\\ &= -4\%\end{aligned}$$

OR

$$\begin{aligned}\text{change in price} &= \frac{\text{change in water use}}{\text{E.V.}}\\ &= \frac{-10\%}{-.40}\\ &= +25\%\end{aligned}$$

APPENDIX C

INTRODUCTORY EXERCISE

This form contains a series of questions on participants' backgrounds, attitudes and expectations. Your responses to these questions will be used as a basis for discussion during the workshop and for analysis after the workshop.

1. What type of water system does your community/region have? (CHECK ONE)

___ (1) publicly owned, revenue from water charges, not regulated
___ (2) publicly owned, revenue from water charges, regulated
___ (3) publicly owned, revenue from other sources, not regulated
___ (4) privately owned, revenue from water charges, regulated
___ (5) other, please specify: ______________________________
____

2. What type of community does your system serve? (CHECK ONE)

___ (6) rural
___ (7) suburban
___ (8) urban

3. How many people does your system serve? (CHECK ONE)

___ (9) 1 - 2,500
___ (10) 2,500 - 5,000
___ (11) 5,000 - 10,000
___ (12) 10,000 - 20,000
___ (13) 20,000 - 50,000
___ (14) 50,000 - 100,000
___ (15) 100,000 - 200,000
___ (16) over 200,000

4. Have you ever developed a water conservation plan for a water system? (CHECK ONE)

___ (17) yes
___ (18) no

5. Do you foresee developing a water conservation strategy for your community in the near future? (CHECK ONE)

___ (19) yes
___ (20) no

6. How would you describe your familiarity with the following topics as they relate to designing a water conservation plan? (CIRCLE ONE)

___ (21) financial/economic issues

1	2	3	4	5
poor		good		excellent

___ (22) technical/environmental issues

1	2	3	4	5
poor		good		excellent

___ (23) social/political issues

1	2	3	4	5
poor		good		excellent

___ (24) legal/institutional issues

1	2	3	4	5
poor		good		excellent

7. I am most concerned with: (CHECK AS MANY AS NECESSARY)

___ (25) short-term drought
___ (26) annual peak load demand
___ (27) shortage due to supply contamination
___ (28) future demand exceeding supply
___ (29) frequent droughts
___ (30) augmentation not possible
___ (31) other, please specify: ______________________________
____

8. My three (3) major reasons for attending this workshop are: (CHECK 3)

___ (32) To learn about supply management and/or demand management programs which may be able to achieve the conservation goals of my community
___ (33) To learn how other people and organizations view the basic issues and problems associated with designing a local water conservation plan
___ (34) To update my knowledge of current technologies and practices designed to reduce water use
___ (35) To meet other people involved with water conservation planning
___ (36) To discuss how to improve present policies and mechanisms designed to implement comprehensive conservation plans
___ (37) To participate in a forum for discussion of the cost-effectiveness and impacts associated with alternative conservation strategies
___ (38) My supervisor instructed me to attend the workshop
___ (39) Other, please specify: ______________________________
______________ ______________________________
______________ ______________________________

WORKSHOP EVALUATION

This form contains a series of questions on participants' evaluation of the program presented. Your responses to these questions will be used for analysis after the workshop to improve the effectiveness of future programs. Please complete the questions and submit the form to workshop staff at the conclusion of the day's program. Thank you for your time and cooperation.

1. Indicate the effectiveness of each session in meeting your needs. (CIRCLE ONE)

(51) 9:15 - 9:35 Natural Resource Limitations of the Area

1	2	3	4	5
not effective		satisfactory		very effective

(52) 9:35 - 10:00 Practical Considerations in the Development of Water Conservation Plans

1	2	3	4	5
not effective		satisfactory		very effective

(53) 10:10 - 10:30 Case Study Exercise: Step One

1	2	3	4	5
not effective		satisfactory		very effective

(54) 10:30 - 11:15 The Seven-Step Approach -- An Illustrated Lecture

1	2	3	4	5
not effective		satisfactory		very effective

(55) 11:15 - 12:00 Case Study Exercise: Steps Two and Three

1	2	3	4	5
not effective		satisfactory		very effective

(56) 1:00 - 2:00 Case Study Exercise: Steps Four through Seven

1	2	3	4	5
not effective		satisfactory		very effective

(57) 2:00 - 2:45 Group Discussion and Review of Conservation Plans

1	2	3	4	5
not effective		satisfactory		very effective

(58) 3:00 - 3:30 Application of the Seven-Step Approach to the Local Situation

1	2	3	4	5
not effective		satisfactory		very effective

(59) 3:30 - 3:45 Questions and Answers

1	2	3	4	5
not effective		satisfactory		very effective

2. The 7-Step Approach (CIRCLE ONE)

(60) How similar is the 7-step approach to the way you would have analyzed and planned for a water conservation problem before you attended this workshop?

1	2	3	4	5
basically the same		somewhat similar		very different

(61) How helpful will the 7-step approach be to you in analyzing and planning for water conservation needs in your community?

1	2	3	4	5
not helpful		somewhat helpful		very helpful

(62) Do you foresee following the 7-step approach in developing a water conservation strategy for your community in the near future?

1	2	3	4	5
no		will use the approach as a guide		will follow the approach

3. Apart from the 7-step approach itself, how useful was the information presented at the workshop? (CIRCLE ONE)

(63) Information in general

1	2	3	4	5
not useful		somewhat useful		very useful

(64) Information on impacts and mitigation measures

1	2	3	4	5
not useful		somewhat useful		very useful

(65) Information on pricing, price elasticity, and pricing structures

1	2	3	4	5
not useful		somewhat useful		very useful

(66) Information on public education

1	2	3	4	5
not useful		somewhat useful		very useful

4. Evaluation of the Workshop as a Whole. (CIRCLE ONE)

(67) Amount of background material presented

1	2	3	4	5
poor		adequate		excellent

(68) Quality of background material presented

1	2	3	4	5
poor		adequate		excellent

(69) Method of presentation

1	2	3	4	5
poor		adequate		excellent

(70) Amount of attendee participation

1	2	3	4	5
poor		adequate		excellent

5. General Comments and Suggestions

(71) How could the 7-step approach be changed to make it more relevant to your needs?

____

____

____

(72) Were there any topics not covered in the workshop that you think should be covered at another workshop?

____

____

____

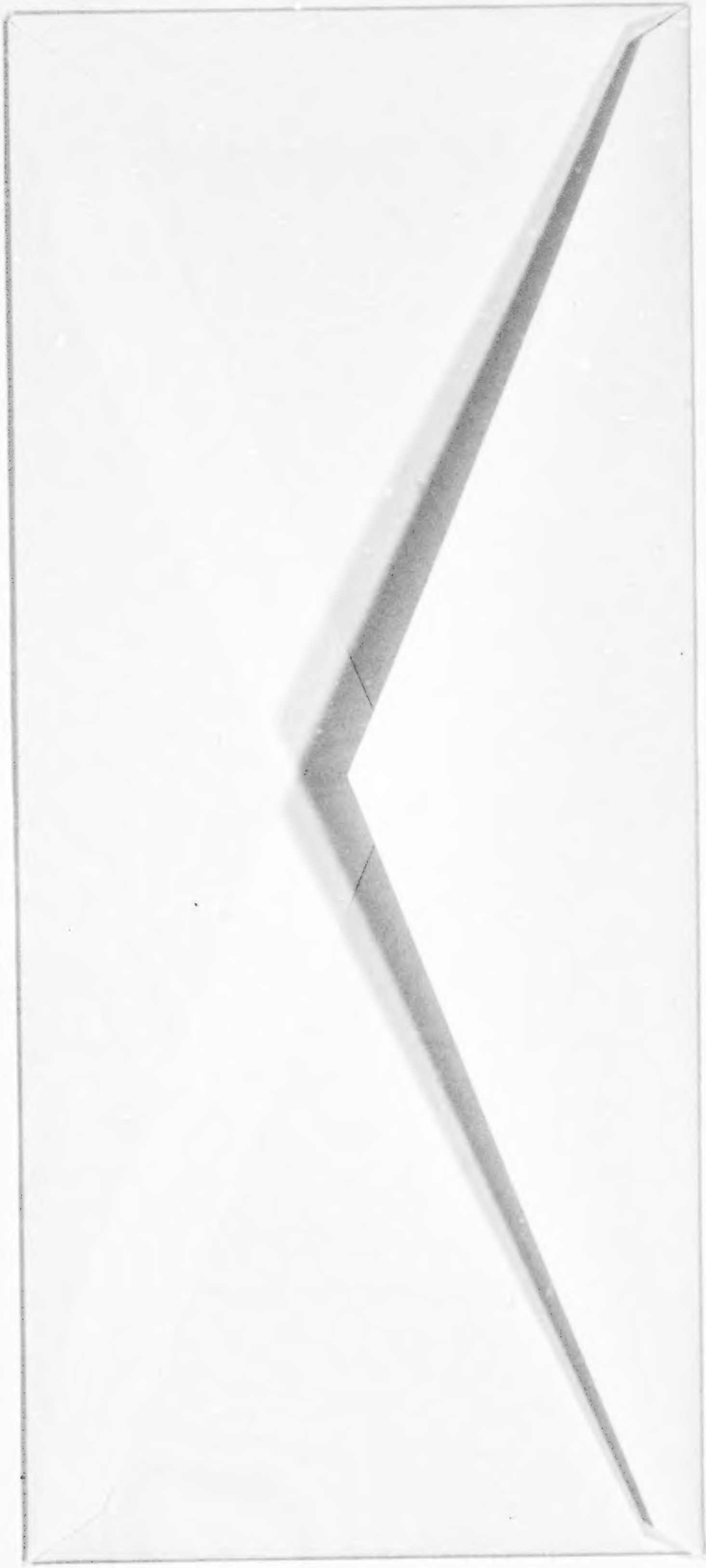
(73) Other comments on the workshop:

____

____

____

APPENDIX D



APPENDIX E

PUBLIC MEETING CHECKLIST

1. Primary meeting purpose: ____
____

2. Meeting audience (identify potential participants):
a. Interests identified and categorized: ______________________
____
b. Organizations and individuals identified: __________________
____

3. Meeting format: ____

4. Meeting place: ____
DATE: ________________________ TIME: ______________________
Rain Date: ____________________________

5. Does the meeting place have:

A. a central location? ___ yes ___ no
B. public transportation access? ___ yes ___ no
C. suitable parking? ___ yes ___ no
D. adequate facilities:
  1. lecterns? ___ yes ___ no
  2. loud speaker system? ___ yes ___ no
  3. blackboards and easels? ___ yes ___ no
  4. projectors? ___ yes ___ no
  5. tape recorders? ___ yes ___ no
  6. chairs? ___ yes ___ no
  7. tables? ___ yes ___ no
  8. meeting room setup? ___ yes ___ no
  9. meeting room cleanup? ___ yes ___ no

E. Is there a rental fee? ___ yes ___ no
What does the rental fee include? ____________________________
____

F. Contact at the facility (name, address, phone):
____
____

6. Meeting space:

A. total number of people expected: ____________________
B. seating arrangement and type: ______________________

7. Invitations and notification:

A. Have notices or invitations been prepared? ___ yes ___ no

B. Have notices or invitations been sent to:

1. advisory committee members? ___ yes ___ no
2. interested publics taken from your mailing list? ___ yes ___ no
3. local news media? ___ yes ___ no
4. identifiable interests and organizations? ___ yes ___ no
5. others? ___ yes ___ no

C. Total number of invitations sent: ____________________

D. Will there be follow-up phone calls to key people? ___ yes ___ no

By whom? ____________________
When? ____________________

E. Have your supervisor and other officials been told of the meeting? ___ yes ___ no

Are they to attend? ___ yes ___ no

Has someone reserved the time in their calendars? ___ yes ___ no

8. Has an agenda been prepared and approved? ___ yes ___ no

Has it been distributed? ___ yes ___ no

Does it include:

A schedule of events at the meeting? ___ yes ___ no

Questions to be addressed? ___ yes ___ no

9. Who is sponsoring the meeting? ______________________________

Is there a co-sponsor? ___ yes ___ no
Explain:

____

Has each sponsor approved the agenda and publicity materials? ___ yes ___ no
Explain:

____

Has each sponsoring group's membership been invited formally to a meeting? ___ yes ___ no
Explain:

____

10. Who will moderate or chair the meeting? _________________________

____

Has this person been notified? ___ yes ___ no

11. Graphic and information materials needed for the meeting:

A. What information materials will be handed out?

____

1. Have they been designed and printed? ___ yes ___ no
2. How many copies of each: ________________________________
3. Date due back from the printer or photocopy department:

   ____

B. Will graphics be used in the presentation? ___ yes ___ no

1. What graphics materials are planned? List:

   ____

   ____

2. Have the graphic materials been designed and produced? ___ yes ___ no

3. If not, when will they be produced?

____

4. When are they due back from the production department/contractor?

____

5. Has appropriate display equipment been ordered for the meeting site? ___ yes ___ no

12. Publicity:

A. What publicity methods have been selected?

____

____

____

B. Have materials been prepared? ___ yes ___ no

C. How many copies of each type? ______________________

____

D. When will they be distributed?

____

E. Who will follow up on publicity:

By phone: ______________________________________

In person: _____________________________________

13. Meeting arrangements:

Have the following arrangements been completed or obtained?

A. lecterns, chairs, tables ___ yes ___ no
B. speaker system ___ yes ___ no
C. projectors/screens ___ yes ___ no
D. space cleared for wall displays ___ yes ___ no
E. registration table and space ___ yes ___ no
F. personnel for registration ___ yes ___ no
G. refreshments ordered ___ yes ___ no
H. name tags ordered and completed ___ yes ___ no

I. identification cards for people sitting at a podium ___ yes ___ no
J. room arrangements completed ___ yes ___ no
K. audio-visual equipment tested ___ yes ___ no
L. audio-visual equipment set up ___ yes ___ no
M. ventilation/heating system tested ___ yes ___ no
N. easels and blackboard ordered ___ yes ___ no
O. supplies (pencils, paper, chalk, felt tip pens, scotch tape, masking tape, thumb tacks, scissors, stapler, extension cords) ___ yes ___ no
P. meals ___ yes ___ no
Q. press table ___ yes ___ no
R. facilities restored and cleaned ___ yes ___ no
S. equipment returned ___ yes ___ no

14. Have senior officials giving presentations been briefed? ___ yes ___ no

15. Recording the proceedings:

Method(s) to be used: ____

____

Personnel or equipment ordered and obtained? ___ yes ___ no

16. Meeting evaluation:

Method(s) chosen: ____

Evaluation completed? ___ yes ___ no

Recommendations made? ___ yes ___ no

Accepted? ___ yes ___ no

APPENDIX F

LOCAL WATER CONSERVATION PLANNING WORKSHEET

Name of Community or Utility ____________________

Nature of Water Problem:

Objectives of Conservation (or Drought Management) Effort:

Criteria for a Successful Plan:

Available Local Resources:

Critical Constraints or Barriers:

Programs Most Likely to be in Conservation Plan:

Supply (or system) Management:

Demand Management:

CONSERVATION PLANNING TIMELINE

Supply Management Programs

Time Reference Points

Demand Management Programs